```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     Cam sequence : 1-5-3-6-2-4
Note inst. in remarks column
Test sheet
                                                     SD ang. spacing ^{\circ}CS: 0-60-120-180-240-300 Tolerance + - : 0,50 (0,75)
                   : SCA 11,0U14
: 24.8.87
Edition
Superceeded
                   : 11.86
                 : ISO-4113
Calibrating oil
                                                     SD mark cyl. no. : 1
                   : 0 402 646 827 0
Combination no.
                                                     BASIC SETTING
                                                                    1/mi: 700
Injection pump
                                                     1st speed
Pump designation : PE6P120A720RS70010
EP type number
                    : 0 412 626 800
                                                     Contr.-rod trav.mm: 10,80...10,90
Governor
                    : RQ200/1000PA713-1
                                                     Del.quantity cm3/: 14,0...14,2
Governor design.
Governer no.
                   : 0 421 801 324
                                                                   100H.: (13,7...14,5)
Customer-spec. information
Customer
                   : SCANIA
                                                     Dispersion
                                                                   cm3/:0,5
Engine
                   : DS11 30
                                                                   100H.: (0,8)
TEST BENCH REQUIREMENTS
                                                     2nd speed
                                                                   1/min: 225
                                                     Contr.-rod trav. m: 4,90...5,10
Del.quantity cm3/: 1,3...1,7
Calibrating-oil inlet temp. °C
                                                                   100H.: (-)
                    : 38...42
                                                                   cm3/: 0.3
100H.: (0,6)
                                                     Dispersion
Overflow valve
                    : 1 417 413 025
                                                     SLEEVE POSITION
                                                     Control-lever position
Inlet press., bar : 1.50
                                                                  Degree: 45...47
                                                                   17min: 800
                                                     Speed
Calibrating nozzle-holder
                : 1 688 901 019
                                                     Cont.-rod travelmm: 15,20...17,80
 assembly
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
                   : 207...210
 pressure, bar
                                                     1st version
Perforated-plate
                                                     Speed
                                                                   1/min: 700
                   : 0.8
                                                     Charge press. hPa : 900
 diameter mm
                                                     Del.quantity cm3/: 140,0...142,0
1000H.: (137,0...145,0)
                                                                  cm3/ : 5.0
Test inj. tubing : 1 680 750 015
                                                     Dispersion
                                                                  1000H.: (8.0)
Outside diameter
x Wall thickness
                                                     HIGHEST RATED SPEED
                : 6,00x1,50x600
x Length mm
                                                     1st version
                                                     Control-lever
                                                      position degrees: 35...43
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                     Setting point:
    per values ____
                                                               1/min : 800
                                                     Speed
                                                     Contr.-rod trav.mm: 16.5
START OF DELIVERY
Test pressure, bar: 25...27
                                                     Testing:
                                                     1st c-rod trav.mm: 9,80
                   : 5,00...5,10
                                                       Speed 1/min: 1045...1060
Prestroke mm
                   : (4,95...5,15)
                                                     2nd c-rod trav.mm : 4,00
Contr.-rod trav.mm: 9,00...12,00
                                                               1/min : 1175...1205
                                                       Speed
A01
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```
4th speed 1/min : 1300
                                                      Del.quantity cm3/: 240,0...290,0
                                                                   1000H.: (-)
  C-rod trav.mm : 0,00...1,00
                                                      Contr.-rod trav.mm: 20,00...21,00
LOWEST RATED SPEED I
Control-lever
                                                      LOW IDLE
 position degrees: 5...13
Setting point w/out aux. spring
                                                                   1/min : 225
                                                      Speed
                                                      Contr.-rod trav.mm: 4,40...4,60
Speed 1/min: 225
Contr.-rod trav.mm: 4.50
                                                      Delivery-valve spring pre-tension
Testing:
                                                      3.2...3.4 mm.
Speed 1/min: 100
C-rod trav.mm min: 5,90
Speed 1/min: 225
                                                      Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring
                                                      preload on new delivery-valve holders
C-rod trav.mm : 4.50
                                                      to 2.9...3.1 mm.
                   : 2,00
C-rod trav.mm
             1/min : 300...340
Speed
 compensator (LDA,ADA,ALDA)
                                                      ADDITIONAL INFORMATION
1st version
Setting
Speed
             1/min : 500
             hPa : 900
Pressure
                                                      Check and set without ROBO diaphragam
Contr.-rod trav.mm: 11,70...11,80
Measur ement
Speed
             1/min : 500
                                                      For comb. With letter index see
                                                      VDT-I-400/116.
1st pressure hPa : -
C-rod trav.mm : 10,40...10,50
2nd pressure hPa : 165
  C-rod trav.mm
                   : 10,50...10,70
FUEL-DELIVERY CHARACTERISTICS
                                                     For sealing see VDT-I-400/117.
1st version
Charge press. hPa : 900
Speed
             1/min : 1000
                                                      Test specifications approved by Scania
Del.quantity cm3/: 143.0...151.0
1000H.: (141.0...153.0)
Speed 1/min: 500
                                                      on 1986-06-04
                                                      Start of delivery - engine: 15° before
                                                     Firing sequence of engine: 1-5-3-6-2-4.
Del.quantity cm3/: 120,0...124,0
             1000H.: (118,0...126,0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 9,80
Speed
             1/min : 1045...1060
STARTING FUEL DELIVERY
Speed
            1/min : 100
A02
```

```
: 3.00...3.10
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     Prestroke mm
                                                                         : (2.95...3.15)
                                                     Contr.-rod trav.mm: 9.00...12.00
Note inst. in remarks column
                                                     Cam sequence : 1-5-3-6-2-4
Test sheet
                   : VOL 12,1 C
: 26.06.87
Edition
Superceeded
                                                     SD ang. spacing ^{0}CS: 0-60-120-180-240-300 Tolerance + - ^{0}: 0.50 (0.75)
Calibrating oil : ISO-4113
                   : 0 402 646 829
Combination no.
                                                     SD mark cyl. no. : 1
Injection pump
Pump designation : PE6P13OA32ORS7113
                                                     BASIC SETTING
EP type number : 0 412 636 803
                                                                   1/mi: 750
Governor
                                                     1st speed
Governor design. : RQ250/775PA770
Governer no. : 0 421 801 316
                                                     Contr.-rod trav.mm: 13.20...13.30
Customer-spec. information
                                                     Del.quantity cm3/ : 29.5...29.8
                   : VOLVO
Customer
                                                                   100H.: (29.2...30.2)
                   : TJD121LG
Engine
                                                                   cm3/: 0.6
                                                     Dispersion
1st version kW : 300.0
Speed
              1/min: 1550
                                                                   100H.: (1.0)
TEST BENCH REQUIREMENTS
                                                                   1/min: 250
                                                     2nd speed
                                                     Contr.-rod trav. m: 4.00...4.20

Del.quantity cm3/: 1.7...2.3

100H.: (-)

Dispersion cm3/: 0.4

100H.: (0.8)
Calibrating-oil inlet temp. °C
                   : 38...42
Overflow valve
                    : 1 417 413 025
                                                     SLEEVE POSITION
                                                     Control-lever position
Inlet press., bar: 1.50
                                                                  Degree: 45...47
                                                                  1/min: 600
Calibrating nozzle-holder
                                                     Cont.-rod travelmm: 19.20...20.80
                : 1 688 901 019
 assembly
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
pressure, bar
                   : 207...210
                                                     1st version
                                                     Speed
                                                                   1/min: 750
Perforated-plate
                    : 0,8
                                                     Charge press. hPa : -
diameter mm
                                                     Del.quantity cm3/: 295.5...298.5
1000H.: (292.0...302.0)
Dispersion cm3/: 6.00
1000H.: (10.00)
Test inj. tubing
                   : 1 680 750 067
Outside diameter
                                                     HIGHEST RATED SPEED
x Wall thickness
                   : 6.00x1.50x1000
                                                     1st version
x Length mm
                                                     Control-lever
                                                      position degrees: 30...38
(A) Injection pump setting values
    Insp. values in parentheses
    Set constant delivery quant.
                                                     Setting point:
                                                     Speed 1/min: 600
    per values
                                                     Contr.-rod trav.mm: 20.0
START OF DELIVERY
Test pressure, bar: 25...27
                                                     Testing:
                                                     1st c-rod trav.mm : 12.20
A03
```

```
Speed 1/min: 820...835
2nd c-rod trav.mm : 4.00
 Speed 1/min: 865...895
              1/min : 950
4th speed
  C-rod trav.mm : 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 5...13
Setting point w/out aux. spring
Speed 1/min : 250
Contr.-rod trav.mm: 4.10
Testing:
Speed 1/min: 100
C-rod trav.mm min: 5.50
Speed 1/min: 250
C-rod trav.mm : 4.10
C-rod trav.mm : 2.00
             1/min : 280...320
Speed
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
full-load trav.mm: 12.20
Speed 1/min: 820...835
STARTING FUEL DELIVERY
Speed 1/min: 100
Del.quantity cm3/: 310.0...350.0
1000H.: (306.0...356.0)
Remarks:
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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                       Prestroke mm
                                                                            : 3.60...3.70
                                                                            : (3.55...3.75)
Note inst. in remarks column
                                                       Contr.-rod trav.mm: 9.00...12.00
                                                        Cam sequence : 1-5-3-6-2-
Test sheet
Edition
Superceeded
                   : VOL 16.0 A
: 24.07.87
                   : 9.86
                                                       SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Calibrating oil : ISO-4113
Combination no.
                   : 0 402 646 832
                                                       SD mark cyl. no. : 1
Injection pump
Pump designation : PE6P130A720RS7122
                                                       BASIC SETTING
EP type number : 0 412 636 804
Governor
                                                       1st speed
                                                                     1/mi: 700
Governor design. : RQV225...930PA799
Governer no. : 0 421 813 544
                                                       Contr.-rod trav.mm: 12.90...13.00
Customer-spec. information
                                                       Del.quantity cm3/: 27.4...27.7
Customer
                   : VOLVO
                                                                      100H.: (27.1...28.1)
Engine
                    : TD162 F
                                                       Dispersion
                                                                      cm3/:0.6
1st version kW : 343.0
              1/min: 1860
                                                                      100H.: (1.0)
Speed
TEST BENCH REQUIREMENTS
                                                                      1/min: 250
                                                       2nd speed
                                                       Contr.-rod trav. m: 5.00...5.20
Del.quantity cm3/: 2.5...3.0
100H.: (2.3...3.3)
Dispersion cm3/: 0.5
100H.: (0.8)
Calibrating-oil inlet temp. °C
                    : 38...42
Overflow valve
                    : 1 417 413 025
                                                        (B) Setting of injection pump with
Inlet press., bar : 1.50
                                                            externally-mounted governor
                                                       SLEEVE TRAVELS
Calibrating nozzle-holder
                                                       1st speed 1/min: 250
Sleeve travel mm: 1.00...1.40
2nd speed 1/min: 350
Sleeve travel mm: 2.10...2.70
3rd speed 1/min: 700
                 : 1 688 901 019
 assembly
Opening
pressure, bar
                   : 207...210
Perforated-plate
                                                          Sleeve travel mm: 6.40...6.60
                                                       4th speed 1/min: 960
                    : 0.8
diameter mm
                                                          Sleeve travel mm: 7.60...7.80
                                                       5th speed 1/min: 1045
                                                          Sleeve travel mm: 9.00...9.40
Test inj. tubing : 1 680 750 067
                                                       SLEEVE POSITION
Outside diameter
x Wall thickness
                                                       Control-lever position
                    : 6.00x1.50x1000
x Length mm
                                                                     Degree: -1
                                                                      1/min: 1010
                                                       Cont.-rod travelmm: 6.70...9.30
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
    per values ____
                                                       1st version
START OF DELIVERY
                                                       Speed
                                                                      1/min: 700
Test pressure, bar: 25...27
                                                       Charge press. hPa: 700
```

Del.quantity cm3/: 274.5...277.5 1000H.: (271.0...281.0) Dispersion cm3/ : 6.001000H.: (10.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 57...65 Testing: 1st c-rod trav.mm : 11.90 Speed 1/min : 960...972 2nd c-rod trav.mm : 4.00 1/min : 1030...1060 Speed 4th speed 1/min : 1150 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 5...13 Testing: 1/min : 100 Speed C-rod trav.mm min : 6.50 Speed 1/min : 250 C-rod trav.mm : 5.00...5.20 CONSTANT REGULATION 1/min : 225...400 Speed compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 hPa : 700 Speed Pressure Contr.-rod trav.mm: 12.90...13.00 Measurement 1/min : 500 Speed 1st pressure hPa : -: 9.70...9.80 C-rod trav.mm 2nd pressure hPa : 80 C-rod trav.mm : 10.00...10.10 3rd pressure http://s. 540 C-rod trav.mm : 12.50...12.70 FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : -Speed 1/min: 700 Del.quantity cm3/: 182.5...185.5 1000H.: (179.0...189.0) ROTATIONAL-SPEED LIMITATION

1mm control-rod travel less than

full-load trav.mm: 11.90 1/min : 960...972 Speed

STARTING FUEL DELIVERY

1/min : 100 Speed Del.quantity cm3/: 125.0...145.0 1000H.: (-) Contr.-rod trav.mm: 9.70...9.80

LOW IDLE

1/min : 250 Speed Contr.-rod trav.mm: 5.00...5.20 Del.quantity cm3/: 25.5...30.5 1000H.: (23.0...33.0) Dispersion cm3/: 5.00 1000H.: (8.00)

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

1st version

Cam sequence : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) : SCA 11,0 V6 Test sheet : 09.03.87 Edition Superceeded : 9.86 : ISO-4113 SD mark cyl. no. : 1 Calibrating oil : 0 402 646 834 BASIC SETTING Combination no. 1/mi: 970 Injection pump 1st speed Pump designation : PE6P12OA72ORS7004 Contr.-rod trav.mm: 12.80...12.90 EP type number : 0 412 626 801 Governor Governor design. : RQ1020PA528-3 Del.quantity cm3/: 21.4...21.6 Governer no. : 0 421 801 348 100H.: (21.1...21.9) Customer-spec. information : SAAB-SCANIA Dispersion cm3/:0.6Customer 100H.: (0.9) : DS11 48.DSI11 47 Engine SLEEVE POSITION TEST BENCH REQUIREMENTS Control-lever position Calibrating-oil inlet temp. OC Degree: 45...47 : 38...42 17min: 600 Speed Cont.-rod travelmm: 15.20...17.80 Overflow valve : 1 417 413 025 FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version Inlet press., bar: 1.50 1/min: 970 Speed Del.quantity cm3/ : 214.0...216.0 Calibrating nozzle-holder 1000H.: (211.0...219.0) assembly : 1 688 901 019 Dispersion cm3/ : 6.001000H.: (9.00) Openina : 207...210 pressure, bar HIGHEST RATED SPEED Perforated-plate 1st version Control-lever diameter mm : 0.8 position degrees: 20...28 : 1 680 750 015 Test inj. tubing Setting point: 1/min : 600 Speed Contr.-rod trav.mm: 16.5 Outside diameter x Wall thickness : 6.00x1.50x600 Testing: x Length mm 1st c-rod trav.mm : 11.80 1/min : 1020...1025 (A) Injection pump setting values Speed Insp. values in parentheses Set constant delivery quant. 2nd c-rod trav.mm: 4.00 1/min : 1066...1081 Speed 1/min : 1120 per values 4th speed C-rod trav.mm : 0.00...1.00 START OF DELIVERY Test pressure, bar: 25...27 ROTATIONAL-SPEED LIMITATION Prestroke mm : 5.00...5.10 1st version : (4.95...5.15) Contr.-rod trav.mm: 9.00...12.00

A07

```
1mm control-rod travel less than
full-load trav.mm: 11.80
Speed 1/min: 1020...1025
STARTING FUEL DELIVERY

Speed 1/min: 100
Del.quantity cm3/: 240.0...290.0
1000H.: (-)
Contr.-rod trav.mm: 20.00...21.00
HIGH IDLE
Contr.-rod trav.mm: 4.90...5.10
Dispersion cm3/: 4.00
1000H.: (7.00)
```

APPLICATION Generator set

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                          : 4.90...5.00
                                                      Prestroke mm
                                                                          : (4.85...5.05)
                                                      Contr.-rod trav.mm: 9.00...12.00
Note inst. in remarks column
                                                      Cam sequence : 1-5- 3- 6- 2- 4
Test sheet
                   : STE 12.0 E
: 09.03.87
                    : 9.86
Superceeded
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Calibrating oil : ISO-4113
Combination no.
                    : 0 402 646 835
                                                      SD mark cyt. no. : 1
Injection pump
Pump designation : PE6P120A720RS7123
                                                      BASIC SETTING
EP type number
                   : 0 412 626 814
Governor
                                                      1st speed
                                                                    1/mi: 1100
Governor design. : RQ300/1100PA784-1
Governer no.
                   : 0 421 801 349
                                                      Contr.-rod trav.mm: 10.20...10.30
                                                      Del.quantity cm3/: 17.0...17.2
Customer-spec. information
Customer
                    : STEYR
                                                                     100H.: (16.7...17.5)
Engine
                    : WD615.68
                                                                    cm3/:0.6
                                                      Dispersion
1st version kW : 228.0
              1/min: 2200
                                                                     100H.: (1.0)
Speed
                                                      2nd speed 1/min: 300
Contr.-rod trav. m: 6.30...6.50
TEST BENCH REQUIREMENTS
                                                      Del.quantity cm3/: 1.5...2.1
100H.: (-)
Calibrating-oil inlet temp. °C : 38...42
                                                                     cm3/:0.8
                                                      Dispersion
                                                                     100H.: (1.2)
Overflow valve
                    : 1 417 413 025
                                                      SLEEVE POSITION
Inlet press., bar : 1.50
                                                      Control-lever position
                                                                   Degree: 45...47
                                                                    17min: 600
Calibrating nozzle-holder
                                                      Cont.-rod travelmm: 15.60...16.40
 assembly
                 : 1 688 901 019
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
 pressure, bar : 207...210
                                                      1st version
                                                      Speed 1/min: 1100
Charge press. hPa: 1200
Del.quantity cm3/: 170.0...172.0
1000H.: (167.0...175.0)
Dispersion cm3/: 6.00
1000H.: (10.00)
Perforated-plate
                    : 0.8
diameter mm
Test inj. tubing : 1 680 750 067
Outside diameter
x Wall thickness
                                                      HIGHEST RATED SPEED
                    : 6.00x1.50x1000
                                                      1st version
x Length mm
                                                      Control-lever
(A) Injection pump setting values
                                                       position degrees: 30...38
    Insp. values in parentheses
Set constant delivery quant.
                                                      Setting point:
                                                      Speed 1/min : 600
    per values
                                                      Contr.-rod trav.mm: 16.0
START OF DELIVERY
Test pressure, bar: 25...27
                                                      Testing:
                                                      1st c-rod trav.mm : 9.20
```

A09

1/min : 1145...1160 Speed 2nd c-rod trav.mm : 4.00 1/min : 1185...1215 1/min : 1300 Speed 4th speed C-rod tray.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 9...19 Setting point w/out aux. spring Speed 1/min: 300 Contr.-rod trav.mm: 6.40 Testing: 1/min : 100 Speed C-rod trav.mm min : 7.80 Speed 1/min: 300 : 6.40 C-rod trav.mm : 2.00 C-rod trav.mm 1/min: 405...445 Speed TORQUE CONTROL Dimension a mm : 0.55 Torque-control curve - 1st version 1st speed 1/min : 1100 C-rod trav.mm : 10.20...10.30 2nd speed 1/min: 700 C-rod trav.mm : 11.10...11.30 3rd speed 1/min : 1020 C-rod trav.mm : 10.30...10.50 4th speed 1/min: 960 C-rod trav.mm : 10.70...10.90 compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 Speed Pressure hPa : 1200 Contr.-rod trav.mm: 10.90...11.00 Measurement 1/min : 500 Speed 1st pressure hPa : -: 8.50...8.60 C-rod trav.mm 2nd pressure hPa : 640 C-rod trav.mm : 10.40...10.50 3rd pressure hPa : 460 : 9.50...9.70 C-rod trav.mm FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 1200 Speed 1/min : 700 Del.quantity cm3/ : 182.0...188.0 1000H.: (179.0...191.0)

A10

Charge press. hPa: Speed 1/min: 700
Del.quantity cm3/: 121.0...123.0
1000H.: (118.0...126.0)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 9.20 Speed 1/min: 1145...1160

STARTING FUEL DELIVERY

Speed 1/min: 100
Del.quantity cm3/: 230.0...260.0
1000H.: (-)
Contr.-rod trav.mm: 20.00...21.00

Remarks:
Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm
Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

```
: 3.60...3.70
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Prestroke mm
                                                                          : (3.55...3.75)
Note inst. in remarks column
                                                      Contr.-rod trav.mm: 9.00...12.00
                                                      Cam sequence : 1-5-3-6-2-4
Test sheet
                   : VOL 16.0 B : 03.04.87
Edition
Superceeded
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Toterance + - 0.50 (0.75)
Calibrating oil : ISO-4113
                   : 0 402 646 837
Combination no.
                                                      SD mark cyl. no. : 1
Injection pump
Pump designation : PE6P130A720RS7134
                                                      BASIC SETTING
EP type number : 0 412 636 805
Governor
                                                      1st speed
                                                                   1/mi: 700
Governor design. : RQV225...930PA849
Governer no. : 0 421 813 600
                                                      Contr.-rod trav.mm: 12.90...13.00
                                                      Del.quantity cm3/: 27.5...27.7
Customer-spec. information
Customer
                   : VOLVO
                                                                    100H.: (27.1...28.1)
Engine
                   : TD160
                                                      Dispersion
                                                                    cm3/:0.6
1st version kW : 320.0
Speed
              1/min: 1860
                                                                    100H.: (1.0)
TEST BENCH REQUIREMENTS
                                                      2nd speed
                                                                    1/min: 225.0
                                                      Contr.-rod trav. m: 5.1...5.3

Del.quantity cm3/: 2.5...2.9

100H.: (2.2...3.2)

Dispersion cm3/: 0.4

100H.: (0.8)
Calibrating-oil inlet temp. °C
                   : 38...42
Overflow valve
                    : 1 417 413 025
                                                      (B) Setting of injection pump with
                                                          externally-mounted governor
Inlet press., bar : 1.50
                                                      SLEEVE TRAVELS
Calibrating nozzle-holder
                                                      1st speed 1/min: 225
              : 1 688 901 019
assembly
                                                        Sleeve travel mm: 0.90...1.00
                                                      2nd speed 1/min: 440
Opening
                   : 207...210
                                                        Sleeve travel mm: 3.60...3.90
pressure, bar
                                                      3rd speed 1/min: 750
                                                        Sleeve travel mm: 6.40...6.60
Perforated-plate
                                                      4th speed 1/min: 980
Sleeve travel mm: 7.90...8.10
                   : 0.8
diameter mm
                                                      5th speed 1/min: 1050
                                                        Sleeve travel mm: 9.20...9.40
Test inj. tubing : 1 680 750 067
                                                      SLEEVE POSITION
Outside diameter
x Wall thickness
                                                      Control-lever position
                                                      Degree: -1
Speed 1/min: 1010
Cont.-rod travelmm: 15.20...17.80
                   : 6.00x1.50x1000
x Length mm
(A) Injection pump setting values
    Insp. values in parentheses
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
    Set constant delivery quant.
    per values
                                                      1st version
START OF DELIVERY
                                                      Speed
                                                                    1/min: 700
                                                      Charge press. hPa: 700
Test pressure, bar: 25...27
```

Del.quantity cm3/: 275.0...277.0 1000H.: (271.0...281.0) cm3/ : 6.00Dispersion 1000H.: (10.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 58...66 Testing: 1st c-rod trav.mm : 11.90 1/min : 975...985 Speed 2nd c-rod trav.mm : 4.00 1/min : 1040...1070 Speed 1/min : 1200 4th speed C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 5...13 Testing: 1/min : 100 Speed C-rod trav.mm min : 6.60 Speed 1/min: 225 C-rod trav.mm : 5.10...5.30 CONSTANT REGULATION 1/min : 225...390 Speed compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 hPa : 700 Speed Pressure Contr.-rod trav.mm: 12.90...13.00 Measurement 1/min : 500 Speed 1st pressure hPa : 9.70...9.80 C-rod trav.mm 2nd pressure hPa : 560 C-rod trav.mm : 12.70...12.80 3rd pressure hPa : 90 C-rod trav.mm : 10.00...10.20 FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 700 Del.quantity cm3/ : 182.0...186.0 1000H.: (179.0...189.0) ROTATIONAL-SPEED LIMITATION 1st version

1mm control-rod travel less than

full-load trav.mm: 11.90 1/min: 975...985 Speed

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 125.0...145.0 1000H.: (-)

Contr.-rod trav.mm: 9.70...9.80

LOW IDLE

1/min : 225 Speed Contr.-rod trav.mm: 5.10...5.30 Del.quantity cm3/: 25.0...29.0 1000H.: (22.0...32.0)

cm3/: 4.00Dispersion Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     START OF DELIVERY
                                                     Test pressure, bar: 25...27
Note inst. in remarks column
                                                                        : 5.30...5.40
                                                    Prestroke mm
Test sheet
                   : MB 11,0 T
                                                                        : (5.25...5.45)
                   : 14.08.87
                                                     Contr.-rod trav.mm: 20.00...21.00
Edition
Superceeded
                                                                       : 6- 3- 5- 2-
                                                     Cam sequence
                   : ISO-4113
Calibrating oil
Combination no.
                   : 0 402 646 838
Injection pump
                                                     SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300
Pump designation
                   : PE6P120A320L87808
                                                                          -360
                                                     Tolerance + - 0
EP type number
                   : 0 412 626 816
                                                                        : 0.50 (0.75)
Governor
Governor design. : RQ300/1050PA762-4
Governor no. : 0 421 801 390
                                                     SD mark cyl. no. : 6
                                                    BASIC SETTING
Customer-spec. information
Customer
                   : DAIMLER-BENZ
                                                                1/mi: 600
                                                     1st speed
                                                    Contr.-rod trav.mm: 13.90...14.10
                   : 0M441 LA
Engine
1st version kW : 240.0
                                                    Del.quantity cm3/: 21.1...21.3
              1/min: 2100
Speed
                                                                   100H.: (20.8...21.6)
TEST BENCH REQUIREMENTS
                                                                   cm3/:0.5
                                                    Dispersion
Calibrating-oil inlet temp. OC
                   : 38...42
                                                                   100H.: (0.9)
                                                    2nd speed 1/min: 300.0
Contr.-rod trav. m: 5.7...6.0
Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.5)
Overflow valve
                   : 1 417 413 025
Inlet press., bar : 1.50
                                                                  cm3/: 0.6
100H.: (1.0)
                                                    Dispersion
Overflow
 quantity min. 1/h: 100...120
                                                     (B) Setting of injection pump with
                                                         externally-mounted governor
Calibrating nozzle-holder
             : 1 688 901 019
 assembly
                                                    SLEEVE TRAVELS
                                                     1st speed 1/min: 300
Opening
pressure, bar
                                                       Sleeve travel mm: 1.50...1.70
                   : 207...210
                                                    2nd speed 1/min: 600
Perforated-plate
                                                       Sleeve travel mm: 5.90...6.10
                                                    3rd speed 1/min: 875
                   : 0.8
 diameter mm
                                                       Sleeve travel mm: 6.20...6.30
                                                    4th speed 1/min: 1100
                  : 1 680 750 067
                                                       Sleeve travel mm: 6.60...6.80
Test inj. tubing
                                                    5th speed 1/min: 1200
Outside diameter
                                                       Sleeve travel mm: 9.80...10.20
x Wall thickness
                   : 6.00x1.50x1000
                                                    SLEEVE POSITION
x Length mm
                                                    Control-lever position
                                                                 Degree: 108...110
1/min: 600
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                    Cont.-rod travelmm: 19.20...20.80
    per values
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
```

1st pressure hPa : 300 1st version C-rod trav.mm : 10.80...11.00 Speed 1/min: 600 2nd pressure hPa : 550 Charge press. hPa : 900 : 12.60...12.80 C-rod trav.mm Del.quantity cm3/: 211.0...213.0 1000H.: (208.0...216.0) Dispersion cm3/: 5.00 1000H.: (9.00) 3rd pressure hPa : 1050 C-rod trav.mm : 14.00...14.10 4th pressure hPa : 1150 : 14.50...14.70 C-rod trav.mm HIGHEST RATED SPEED SWITCH-OVER POINT 1st version Control-lever 1/min : 220 (240) Speed position degrees: 36...44 FUEL-DELIVERY CHARACTERISTICS Setting point: 1/min : 600 Speed Contr.-rod trav.mm: 20.0 1st version Charge press. hPa: 1350 1/min : 1050 Testing: Speed Del.quantity cm3/: 236.0...239.0 1000H.: (233.0...242.0) 1st c-rod trav.mm : 13.80 1/min : 1095...1110 Speed cm3/: 8.0 1000H.: (12.0) 2nd c-rod trav.mm : 4.00 Dispersion 1/min : 1180...1210 Speed Charge press. hPa: 1350 Speed 1/min: 800 1/min : 1300 4th speed C-rod tray.mm : 0.00...1.50 Del.quantity cm3/: 242.0...246.0 LOWEST RATED SPEED I 1000H.: (239.0...249.0) Control-lever cm3/:8.0Dispersion 1000H.: (12.0) position degrees: 8...16 Setting point w/out aux. spring Charge press. hPa : -Speed 1/min: 500
Del.quantity cm3/: 135.0...137.0
1000H.: (132.0...140.0)
Dispersion cm3/: 8.0 1/min : 300 Speed Contr.-rod trav.mm: 5.85 Testing: 1/min : 200 1000H.: (12.0) Speed C-rod trav.mm min : 7.50 ROTATIONAL-SPEED LIMITATION Speed 1/min : 300 C-rod trav.mm : 5.85 C-rod trav.mm : 2.00 Speed 1/min : 370...410 1st version 1mm control-rod travel less than Speed TORQUE CONTROL full-load trav.mm: 13.80 1/min: 1095...1110 Dimension a mm : 0.30 Speed 2nd speed 1/min : 1050 C-rod trav.mm : 14.80...15.00 STARTING FUEL DELIVERY 3rd speed 1/min: 800 C-rod trav.mm : 15.10...15.30 1/min : 100 Speed Del.quantity cm3/: 190.0...210.0 compensator (LDA, ADA, ALDA) 1000H.: (186.0...214.0) 1st version Remarks: Setting 1/min : 600 Speed hPa : 800 Pressure Contr.-rod trav.mm: 13.90...14.10 Measurement

Speed

1/min : 600

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,0 T1 : 09.03.87 Edition

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 646 840

Injection pump

Pump designation : PE6P12OA32OLS78O8-1 EP type number : 0 412 626 817

Governor

Governor design. : RQ325/1050PA762-3 Governer no. : 0 421 801 381

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M441 LA

1st version kW : 240.0 Speed 1/min: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Calibrating nozzle-holder assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

```
START OF DELIVERY
Test pressure, bar: 25...27
                                                        1st version
                                                                       1/min: 600
                                                        Speed
                                                        Charge press. hPa: 800
Del.quantity cm3/: 209.0...211.0
1000H.: (206.0...214.0)
Dispersion cm3/: 5.00
                    : (3.95...4.15)
Prestroke mm
Contr.-rod trav.mm: 20.00...21.00
                    : 6-3-5-2-4-1
Cam sequence
                                                                      1000H.: (9.00)
                                                        HIGHEST RATED SPEED
                                                        1st version
SD ang. spacing CS: 0-45-120-165-240-285
                                                        Control-lever
                       -360
                                                         position degrees: 36...44
Tolerance + - 0
                     : 0.50 (0.75)
                                                        Setting point:
SD mark cyl. no. : 6
                                                        Speed
                                                                     1/min : 600
                                                        Contr.-rod trav.mm: 20.0
BASIC SETTING
                                                        Testing:
            1/mi: 600
                                                        1st c-rod trav.mm : 14.40
1st speed
                                                        Speed 1/min: 1095...1110
2nd c-rod trav.mm: 4.00
Contr.-rod trav.mm: 14.50...14.70
                                                        Speed 1/min: 1195...1225
4th speed 1/min: 1300
Del.quantity cm3/ : 20.9...21.1
                                                          C-rod trav.mm : 0.00...1.50
               100H.: (20.6...21.4)
                                                        LOWEST RATED SPEED I
               cm3/:0.5
                                                        Control-lever
Dispersion
                                                        position degrees: 8...16
                                                        Setting point w/out aux. spring
               100H.: (0.9)
                                                                      1/min : 325
2nd speed
               1/min: 325.0
                                                        Contr.-rod trav.mm: 6.5
Contr.-rod trav. m: 6.4...6.6
Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.5)
Dispersion cm3/: 0.6
100H.: (1.0)
                                                        Testing:
                                                                      1/min : 100
                                                        Speed
                                                        C-rod trav.mm min: 8.00
                                                                     1/min : 325
                                                        Speed
                                                        C-rod trav.mm : 6.50
C-rod trav.mm : 2.00
(B) Setting of injection pump with
    externally-mounted governor
                                                                     1/min : 405...445
                                                        Speed
                                                        TORQUE CONTROL
SLEEVE TRAVELS
1st speed 1/min: 300
Sleeve travel mm: 1.50...1.70
                                                        Dimension a mm : 0.30
                                                        2nd speed 1/min: 1050
2nd speed 1/min: 600
Sleeve travel mm: 5.90...6.10
                                                          C-rod trav.mm : 15.40...15.60
                                                        3rd speed 1/min: 800
3rd speed 1/min: 875
                                                          C-rod trav.mm
                                                                             : 15.70...15.90
Steeve travel mm: 6.20...6.30
4th speed 1/min: 1100
Steeve travel mm: 6.60...6.80
5th speed 1/min: 1200
                                                         compensator (LDA,ADA,ALDA)
  Sleeve travel mm: 9.80...10.20
                                                        1st version
                                                        Setting
                                                                      1/min: 600
SLEEVE PUSITION
                                                        Speed
Control-lever position
                                                        Pressure
                                                                    hPa : 800
             Degree: 108...110
1/min: 600
                                                        Contr.-rod trav.mm: 14.50...14.70
Cont.-rod travelmm: 19.20...20.80
                                                        Measurement
                                                        Speed 1/min: 600
FULL-LOAD DELIV. AT FULL-LOAD STOP
```

```
: 300
1st pressure hPa
                    : 12.20...12.40
: 450
  C-rod trav.mm
2nd pressure hPa
                    : 13.30...13.50
  C-rod trav.mm
                    : 900
3rd pressure hPa
                    : 14.60...14.70
  C-rod trav.mm
                  : 1100
4th pressure hPa
                    : 15.30...15.50
  C-rod trav.mm
SWITCH-OVER POINT
Speed
             1/min : 245 (265)
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 1300
             1/min : 1050
Speed
Del.quantity cm3/: 231.0...234.0
             1000H.: (228.0...237.0)
              cm3/:8.0
Dispersion
             1000H.: (12.0)
Charge press. hPa : 1300
             1/min: 800
Speed
Del.quantity cm3/: 234.0...238.0
1000H.: (231.0...241.0)
             cm3/: 8.0
1000H.: (12.0)
Dispersion
Charge press. hPa : -
             1/min : 500
Speed
Del.quantity cm3/ : 133.0...135.0
             1000H.: (130.0...138.0)
              cm3/:8.0
Dispersion
             1000H.: (12.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 14.40
Speed
             1/min : 1095...1110
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 190.0...210.0
1000H.: (186.0...214.0)
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition : MB 11.0 T2 : 27.03.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 646 843

Injection pump

Pump designation : PE6P120A320LS7808 EP type number : 0 412 626 816 Governor

Governor design. : RQV300...1050PA797-2

Governer no. : 0 421 813 614

Customer-spec. information

: DAIMLER-BENZ Customer

: 0M441 LA Engine

1st version kW : 240.0 Speed 1/min: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Overflow

quantity min. 1/h: 100...120

Calibrating nozzle-holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

```
START OF DELIVERY
Test pressure, bar: 25...27
                                                        1st version
                                                                       1/min: 600
                                                        Speed
                    : 5.30...5.40
: (5.25...5.45)
Prestroke mm
                                                        Charge press. hPa: 800
                                                        Del.quantity cm3/: 209.0...211.0
1000H.: (206.0...214.0)
Dispersion cm3/: 5.00
Contr.-rod trav.mm: 20.00...21.00
Cam sequence : 6-3-5-2-4-1
                                                                      1000H.: (9.00)
                                                        HIGHEST RATED SPEED
                                                        1st version
SD ang. spacing CS: 0-60-120-180-240-300
                                                        Control-lever
                       -360
                                                         position degrees: 36...44
Tolerance + - 0
                     : 0.50 (0.75)
                                                        Testing:
SD mark cyl. no. : 6
                                                        1st c-rod trav.mm : 13.60
                                                        Speed 1/min: 1095...1110
2nd c-rod trav.mm: 4.00
BASIC SETTING
                                                           Speed 1/min: 1170...1200
1st speed
            1/mi: 600
                                                        4th speed 1/min: 1300
                                                          C-rod trav.mm : 0.00...1.50
Contr.-rod trav.mm: 13.80...14.00
                                                        LOWEST RATED SPEED I
Del.quantity cm3/: 20.9...21.1
                                                        Control-lever
                                                         position degrees: 8...16
               100H.: (20.6...21.4)
                                                        Testing:
Dispersion
               cm3/:0.5
                                                                      1/min : 190
                                                        Speed
                                                        C-rod trav.mm min : 7.00
                                                        Speed 1/min: 300
C-rod trav.mm : 5.50...5.80
               100H.: (0.9)
              1/min: 300.0
2nd speed
Contr.-rod trav. m: 5.5...5.8
Del.quantity cm3/: 1.6...2.2
                                                        CONSTANT REGULATION
                                                                      1/min : 300...450
                                                        Speed
               100H.: (1.3...2.5)
               cm3/: 0.6
100H.: (1.0)
Dispersion
                                                        TORQUE CONTROL
                                                        Dimension a mm
                                                                             : 0.30
                                                        2nd speed 1/min: 1050
C-rod trav.mm: 14.60...14.80
(B) Setting of injection pump with
    externally-mounted governor
                                                        3rd speed 1/min: 800
                                                          C-rod trav.mm
                                                                            : 14.90...15.10
SLEEVE TRAVELS
1st speed 1/min: 300
                                                         compensator (LDA, ADA, ALDA)
Steeve travel mm: 1.20...1.40
2nd speed 1/min: 600
Steeve travel mm: 4.90...5.10
3rd speed 1/min: 1075
Steeve travel mm: 7.40...7.60
4th speed 1/min: 1100
                                                        1st version
                                                        Setting
                                                                      1/min : 600
                                                        Speed
                                                                     hPa : 800
                                                        Pressure
  Sleeve travel mm: 8.00...8.40
                                                        Contr.-rod trav.mm: 13.80...14.00
5th speed 1/min: 1150
  Sleeve travel mm: 9.00...9.40
                                                        Measurement
                                                                     1/min : 600
                                                        Speed
SLEEVE POSITION
Control-lever position
                                                        1st pressure hPa : 300
                                                          C-rod trav.mm : 10.70...10.90
              Degree: -1
                                                        2nd pressure hPa : 550
Speed
              17min: 600
Cont.-rod travelmm: 15.80...17.80
                                                          C-rod trav.mm : 12.60...12.80
                                                        3rd pressure hPa : 975
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                                             : 13.90...14.00
                                                          C-rod trav.mm
A19
```

4th pressure hPa : 1100 C-rod trav.mm : 14.40...14.60 SWITCH-OVER POINT Speed 1/min : 220 (240) FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 1300 1/min : 1050 Speed Del.quantity cm3/: 231.0...234.0 Unspersion cm3/: 8.0 1000H.: (12.0)
Charge press. hPa : 1300
Speed 1/min 1000H.: 1000H.: (228.0...237.0) Del.quantity cm3/: 238.0...242.0 1000H.: (235.0...245.0) cm3/:8.0Dispersion 1000H.: (12.0) Charge press. hPa : -Speed 1/min : 5 Speed 1/min: 500 Del.quantity cm3/: 133.0...135.0 1000H.: (130.0...138.0) cm3/:8.0Dispersion 1000H.: (12.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 13.60 Speed 1/min : 1095...1110 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 190.0...210.0 1000H.: (186.0...214.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition : SCA 11.1 C : 14.08.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 646 845

Injection pump

: PE6P12OA72ORS7139 Pump designation EP type number : 6 412 626 819

Governor

Governor design. : RQV200...1000PA725-2

Governer no. : 0 421 813 632

Customer-spec. information

Customer : SAAB-SCANIA

Engine : DSC11 13

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Calibrating nozzle-holder

: 1 688 901 019 assembly `

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm : (4.95...5.15)

Contr.-rod trav.mm: 9.00...12.00

```
Cam sequence
                : 1- 5- 3- 6- 2- 4
                                                          HIGHEST RATED SPEED
                                                          1st version
                                                          Control-lever
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0.50 (0.75)
                                                           position degrees: 59...67
                                                          Testing:
SD mark cyl. no. : 1
                                                          1st c-rod trav.mm : 14.20
                                                                       1/min : 1040...1050
BASIC SETTING
                                                          2nd c-rod trav.mm: 4.00
                                                                        1/min : 1165...1195
                                                            Speed
                                                                        1/min : 1300
1st speed
                1/mi: 700
                                                          4th speed
                                                            C-rod trav.mm : 0.00...1.00
Contr.-rod trav.mm: 15.20...15.30
                                                          LOWEST RATED SPEED I
Del.quantary cm3/: 23.6...23.8
                                                          Control-lever
                                                           position degrees: 7...15
               100H.: (23.3...24.1)
                                                          Testing:
Dispersion
               cm3/:0.6
                                                          Speed
                                                                        1/min : 125
                                                          C-rod trav.mm min : -
               100H.: (0.9)
                                                                       1/min : 225
                                                          Speed
                                                          C-rod trav.mm
                                                                               : 5.10...5.70
2nd speed 1/min: 225.0

Contr.-rod trav. m: 5.1...5.7

Del.quantity cm3/: 1.8...2.2

100H.: (1.6...2.4)

Dispersion cm3/: 0.3
                                                          CONSTANT REGULATION
                                                          Speed
                                                                        1/min : 225...500
                                                           compensator (LDA, ADA, ALDA)
               100H.: (0.6)
(B) Setting of injection pump with externally-mounted governor
                                                          1st version
                                                          Setting
                                                                        1/min : 500
                                                          Speed
SLEEVE TRAVELS
                                                                        hPa : 900
                                                          Pressure
                                                          Contr.-rod trav.mm: 15.20...15.30
1st speed 1/min: 225
  Sleeve travel mm: 1.20...1.60
2nd speed 1/min: 350
                                                          Measurement
Steeve travel mm: 2.40...3.00
3rd speed 1/min: 700
Steeve travel mm: 4.80...5.40
4th speed 1/min: 1045
                                                                        1/min : 500
                                                          Speed
                                                          1st pressure hPa : -
                                                            C-rod trav.mm
                                                                               : 12.30...12.70
  Sleeve travel mm: 8.40...8.60
                                                          2nd pressure hPa : 535
5th speed 1/min: 1170
                                                            C-rod trav.mm : 14.60...14.70
  Sleeve travel mm: 10.10...10.50
                                                          3rd pressure hPa : 290
                                                            C-rod trav.mm
                                                                               : 13.10...13.30
SLEEVE POSITION
Control-lever position
                                                          FUEL-DELIVERY CHARACTERISTICS
              Degree: -1
1/min: 1040
Speed
Cont.-rod travelmm: 15.20...17.80
                                                          1st version
                                                          Charge press. hPa : 900
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                                        1/min : 1000
                                                          Del.quantity cm3/: 226.0...234.0
1st version
                                                                        1000H.: (224.0...236.0)
Speed
               1/min: 700
                                                          Charge press. hPa :
Charge press. hPa : 900
Del.quantity cm3/ : 236.0...238.0
1000H.: (233.0...241.0)
                                                         Speed 1/min: 500
Del.quantity cm3/: 169.0...173.0
1000H.: (167.0...175.0)
Dispersion cm3/: 6.00
1000H.: (9.00)
                                                         ROTATIONAL-SPEED LIMITATION
```

1st version 1mm control-rod travel less than full-load trav.mm: 14.20 1/min : 1040...1050 Speed STARTING FUEL DELIVERY LOW IDLE Speed 1/min : 225 Contr.-rod trav.mm: 5.10...5.70
Del.quantity cm3/: 18.0...22.0
1000H.: (16.0...24.0)
Dispersion cm3/: 3.00
1000H.: (6.00) Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm. ADDITIONAL INFORMATION Check and set without ROBO diaphragam For comb. with letter index see VDT-I-400/116. For sealing see VDT-I-400/117. Test specifications approved by Scania 1987-07-01 Start of delivery - engine: 15° before

Firing sequence of engine: 1-5-3-6-2-4.

: 3.60...3.70 : (3.55...3.75) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Contr.-rod trav.mm: 9.00...12.00 Note inst. in remarks column Cam sequence : 1-5-3-6-2-4 Test sheet : VOL 16,2 A : 02.06.87 Edition Superceeded SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Calibrating oil : ISO-4113 : 0 402 646 849 Combination no. SD mark cyl. no. : 1 Injection pump Pump designation : PE6P130A320RS7137 BASIC SETTING EP type number : 0 412 636 806 Governor 1st speed 1/mi: 700 Governor design. : RQ750PA865 Contr.-rod trav.mm: 11.40...11.50 Governer no. : 0 421 801 401 Del.quantity cm3/: 34.1...34.3 Customer-spec. information Customer : VOLVO 100H.: (33.8...34.6) : TID162 AG Engine Dispersion cm3/:0.51st version kW : 350.0 100H.: (0.9) 1/min: 1500 Speed TEST BENCH REQUIREMENTS FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating-oil inlet temp. °C 1st version Speed 1/min: 700
Del.quantity cm3/: 341.0...343.0
1000H.: (338.0...346.0)
Dispersion cm3/: 5.00 : 38...42 Overflow valve : 1 417 413 025 1000H.: (9.00) Inlet press., bar : 1.50 HIGHEST RATED SPEED Calibrating nozzle-holder 1st version : 1 688 901 019 assembly Control-lever position degrees: 18...26 Opening pressure, bar : 207...210 Testing: 1st c-rod trav.mm : 10.40 Speed 1/min: 750...755 Perforated-plate : 0.8 diameter mm 2nd c-rod trav.mm : 4.00 Speed 1/min: 777...785 4th speed 1/min : 840 Test inj. tubing : 1 680 750 067 : 0.00...1.00 C-rod trav.mm Outside diameter ROTATIONAL-SPEED LIMITATION x Wall thickness : 6.00x1.50x1000 x Length mm 1st version 1mm control-rod travel less than (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. full-load trav.mm: 10.40 1/min : 750...755 Speed per values STARTING FUEL DELIVERY START OF DELIVERY Test pressure, bar: 25...27 Speed 1/min : 100

HIGH IDLE Speed Dispersion 1/min : 781 cm3/ : 5.00 1000H.: (7.00)

Remarks: APPLICATION Generator

Prestroke mm : 3.60...3.70 : (3.55...3.75) Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2- 4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : PEN 16,2 A : 05.06.87 Edition Superceeded SD ang. spacing  $^{0}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{0}$ : 0.50 (0.75) Calibrating oil : ISO-4113 Combination no. : 0 402 646 850 SD mark cyl. no. : 1 Injection pump BASIC SETTING Pump designation : PE6P130A720RS7140 EP type number : 0 412 636 807 1st speed 1/mi: 700 Governor Governor design. : RQV250...900PA869 Governer no. : 0 421 813 634 Contr.-rod trav.mm: 10.20...10.30 Del.quantity cm3/: 29.2...29.4 Customer-spec. information Customer : VOLVO-PENTA 100H.: (28.8...29.8) : TID 162 AP Engine Dispersion cm3/:0.51st version kW : 357.0 1/min: 1800 100H.: (0.9) Speed 2nd speed 1/min: 250.0 Contr.-rod trav. m: 3.4...3.6 Dispersion cm3/: 0.5 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C 100H.: (0.7) : 38...42 (B) Setting of injection pump with Overflow valve externally-mounted governor : 1 417 413 025 SLEEVE TRAVELS Inlet press., bar : 1.50 1st speed 1/min: 250 Sleeve travel mm: 0.90...1.30 Calibrating nozzle-holder : 1 688 901 019 2nd speed 1/min: 350 assembly Steeve travel mm: 2.00...2.60
3rd speed 1/min: 700
Steeve travel mm: 4.40...5.00 Opening : 207...210 pressure, bar 4th speed 1/min: 925 Sleeve travel mm: 7.30...7.50 Perforated-plate 5th speed 1/min: 985 : 0.8 diameter mm Sleeve travel mm: 8.10...8.50 SLEEVE POSITION : 1 680 750 067 Test inj. tubing Control-lever position Degree: -1 1/min: 960 Outside diameter x Wall thickness Speed : 6.00x1.50x1000 Cont.-rod travelmm: 9.20 x Length mm FULL-LOAD DELIV. AT FULL-LOAD STOP (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. 1st version Speed 1/min: 700 Del.quantity cm3/: 292.0...294.0 per values 1000H.: (288.0...298.0) cm3/: 5.00 START OF DELIVERY Dispersion Test pressure, bar: 25...27 1000H.: (9.00)

HIGHEST RATED SPEED
1st version
Control-lever
position degrees: 55...63
Testing:

1st c-rod trav.mm : 9.20 Speed 1/min : 920...925 2nd c-rod trav.mm : 4.00 Speed 1/min : 970...1000

4th speed 1/min : 1100 C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I Control-lever position degrees: 6...14

Testing:
Speed 1/min: 100
C-rod trav.mm min: 4.90
Speed 1/min: 225
C-rod trav.mm : 3.40...3.60

CONSTANT REGULATION
Speed 1/min: 250...330

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 9.20 Speed 1/min: 920...925

Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

: 1- 2- 7- 3- 4- 5-6- 8 BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence Note inst. in remarks column Test sheet : SCA 14,2 B1 : 09.03.87 SD ang. spacing CS: 0-45-90-135-180-225-Superceeded 270-315 : 9.84 Tolerance + - 0 : 0.50 (0.75) Calibrating oil : ISO-4113 Combination no. : 0 402 643 803 SD mark cyl. no. Injection pump BASIC SETTING Pump designation : PE8P120A920/4L\$7003 EP type number : 0 412 628 801 1/mi: 700 1st speed Governor Contr.-rod trav.mm: 12.80...12.90 Governor design. : RQ750PA528 Governer no. : 0 421 801 126 Del.quantity cm3/: 18.7...18.9 Customer-spec. information 100H.: (18.4...19.2) Customer : SAAB-SCANIA : DS14 41. DSI14 42 43 Engine Dispersion cm3/:0.6TEST BENCH REQUIREMENTS 100H.: (0.9) Calibrating-oil inlet temp. OC SLEEVE POSITION : 38...42 Control-lever position Degree: 45...47 17min: 600 Overflow valve : 1 417 413 D25 Cont.-rod travelmm: 15.20...17.80 FULL-LOAD DELIV. AT FULL-LOAD STOP Inlet press., bar : 1.50 Calibrating nozzle-holder 1st version : 1 688 901 019 1/min: 700 assembly Speed Del.quantity cm3/: 187.0...189.0 1000H.: (184.0...192.0) Dispersion cm3/: 6.00 Opening : 207...210 pressure, bar 1000H.: (9.00) Perforated-plate HIGHEST RATED SPEED diameter mm : 0.8 1st version Control-lever Test inj. tubing : 1 680 750 015 position degrees: 21...29 Outside diameter Setting point: x Wall thickness 1/min : 600 Speed : 6.00x1.50x600 Contr.-rod trav.mm: 16,5 x Length mm (A) Injection pump setting values Testing: 1st c-rod trav.mm : 11.80 Speed 1/min : 750...755 Insp. values in parentheses Set constant delivery quant. 2nd c-rod trav.mm : 4.00 per values 1/min : 784...797 Speed START OF DELIVERY 4th speed 1/min : 850 : 0.00...1.00 Test pressure, bar: 25...27 C-rod trav.mm ROTATIONAL-SPEED LIMITATION Prestroke mm : 5.00...5.10 : (4.95...5.15) Contr.-rod trav.mm: 9.00...12.00 1st version A28

```
1mm control-rod travel less than
 full-load trav.mm: 11.80
              1/min: 750...755
Speed
STARTING FUEL DELIVERY
Speed
               1/min : 100
Del.quantity cm3/: 240.0...290.0
1000H:: (-)
Contr.-rod trav.mm: 20.00...21.00
HIGH IDLE
Contr.-rod trav.mm: 4.90...5.10
Dispersion cm3/: 4.00
1000H.: (7.00)
Remarks:
ADDITIONAL INFORMATION
Check and set without ROBO diaphragam
For comb. with letter index see
VDT-I-400/116.
For sealing see VDT-I-400/117.
Test specifications approved by Scania
on 1986-06-04
Start of delivery - engine:
DS 14 - 180 before TDC
DSI 14 - 170 before TDC
Engine firing sequence: 1-5-4-2-6-3-7-8
APPLICATION
Generator set
```

: 1-2-7- 3- 4- 5-6-8 BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence Note inst. in remarks column : SCA 14,2 BZ Test sheet SD ang. spacing CS: 0-45-90-135-180-225-: 09.03.87 Edition Superceeded : 9.84 270-315 Tolerance + - 0 Calibrating oil : ISO-4113 : 0.50 (0.75) : 0 402 648 805 Combination no. SD mark cyl. no. : 1 Injection pump BASIC SETTING Pump designation : PE8P120A920/4LS7003 EP type number : 0 412 628 801 1/mi: 1000 1st speed Governor Governor design. : RQ1050PA528 Governer no. : 0 421 801 12 Contr.-rod trav.mm: 12.80...12.90 : 0 421 801 128 Del.quantity cm3/: 19.9...20.1 Customer-spec, information 150H.: (19.6...20.4) Customer : SAAB-SCANIA cm3/:0.6: DS14 41 DSI14 43 Engine Dispersion TEST BENCH REQUIREMENTS 100H.: (0.9) Calibrating-oil inlet temp. "C SLEEVE POSITION : 38...42 Control-lever position Degree: 45...47 1/min: 600 Overflow valve : 1 417 413 025 Cont.-rod travelmm: 15.20...17.80 FULL-LOAD DELIV. AT FULL-LOAD STOP Inlet press., bar : 1.50 Calibrating nozzle-holder 1st version : 1 688 901 019 1/min: 1000 assembly Speed Del.quantity cm3/: 199.0...201.0 1000H.: (196.0...204.0) Dispersion cm3/: 6.00 Opening pressure, bar : 207...210 1000H.: (9.00) Perforated-plate HIGHEST RATED SPEED : 0.8 diameter mm 1st version Control-lever Test inj. tubing : 1 680 750 015 position degrees: 20...28 Outside diameter Setting point: x Wall thickness Speed 1/min: 600 : 6.00x1.50x600 Contr.-rod trav.mm: 16.5 x Length mm (A) Injection pump setting values Testing: Insp. values in parentheses Set constant delivery quant. 1st c-rod trav.mm : 11.80 1/min : 1050...1055 Speed per values 2nd c-rod trav.mm : 4.00 1/min : 1098...1113 Speed START OF DELIVERY 1/min : 1150 4th speed Test pressure, bar: 25...27 C-rod trav.mm : 0.00...1.00 ROTATIONAL-SPEED LIMITATION Prestroke mm : 5.00...5.10 : (4.95...5.15) Contr.-rod trav.mm; 9.00...12.00 1st version B02

1mm control-rod travel less than full-load trav.mm: 11.80 peed 1/min: 1050...1055 Speed STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 240.0...290.0 1000H.: (-)
Contr.-rod trav.mm: 20.00...21.00 HIGH IDLE Contr.-rod trav.mm: 4.90...5.10 Dispersion cm3/: 4.00 1000H.: (7.00) Remarks: ADDITIONAL INFORMATION Check and set without ROBO diaphragam For comb. with letter index see VDT-I-400/116. For sealing see VDT-I-400/117. Test specifications approved by Scania on 1986-06-04 Start of delivery - engine: DS 14 - 18 before TDC DSI 14 - 17 before TDC Engine firing sequence: 1-5-4-2-6-3-7-8 APPLICATION Generator set

```
Cam sequence : 1-2-7-3-4-5-6-8
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                   : SCA 14.2 D
: 26.8.87
                                                    SD ang. spacing CS: 0-45-90-135-180-225-
Test sheet
Edition
                                                                         270-315
                                                    Tolerance + - 0
                                                                      : 0,50 (0,75)
Superceeded
                   : 9.86
                  : ISO-4113
Calibrating oil
                                                    SD mark cyl. no. : 1
Combination no.
                   : 0 402 648 802
                                                    START OF DELIVERY DIFFERENCE
Injection pump
Pump designation
                  : PE8P120A920/4L$7008
                                                    betw.c-rod trav.mm: 7,00...13,90
                                                    & c-rod tray max. : 21.00
Difference CS : 1.45...2,15
EP type number
                  : 0 412 628 803
Governor
Governor design. : RQV200...950PA547-1
Governer no.
                  : 0 421 813 360
                                                    BASIC SETTING
                                                    1st speed 1/mi: 700
Customer-spec. information
                   : SAAB-SCANIA
Customer
                                                    Contr.-rod trav.mm: 13,90...14,00
                   : DSC14 01
Engine
                                                    Del.quantity cm3/: 19,7...19,9
TEST BENCH REQUIREMENTS
                                                                 100H.: (19,4...20,2)
Calibrating-oil inlet temp. °C
                   : 38...42
                                                                 cm3/:0.7
                                                    Dispersion
Overflow valve
                                                                 100H.: (1,0)
                   : 1 417 413 025
                                                                 1/min: 225
                                                    2nd speed
Inlet press., bar : 1.50
                                                    Contr.-rod trav. m: 4,70...4,90
                                                   Del.quantity cm3/ : 1,4...1,8
Calibrating nozzle-holder
                                                                 100H.: (-)
               : 1 688 901 019
                                                                 cm3/:0.3
 assembly
                                                    Dispersion
                                                                 100H.: (0,6)
Opening
pressure, bar
                   : 207...210
                                                    (B) Setting of injection pump with
                                                        externally-mounted governor
Perforated-plate
diameter mm
                   : 0.8
                                                    SLEEVE TRAVELS
                                                    1st speed 1/min: 225
                                                   Sleeve travel mm: 1.30...1,50
2nd speed 1/min: 270
                  : 1 680 750 015
Test inj. tubing
                                                    Sleeve travel mm: 1,90...2,10
3rd speed 1/min: 360
Outside diameter
                                                      Sleeve travel mm: 2,60...3,00
x Wall thickness
                                                    4th speed 1/min: 990
                  : 6,00x1,50x600
x Length mm
                                                      Sleeve travel mm: 7,80...8,00
                                                   5th speed 1/min: 1120
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                     Sleeve travel mm: 9,40...9,60
                                                    SLEEVE POSITION
    per values
                                                    Control-lever position
START OF DELIVERY
                                                                Degree: -1
                                                                 17min: 1040
Test pressure, bar: 25...27
                                                    Speed
                                                   Cont.-rod travelmm: 15,20...17,80
                   : 4,50...4,60
Prestroke mm
                   : (4,45...4,65)
                                                   FULL-LOAD DELIV. AT FULL-LOAD STOP
Contr.-rod trav.mm: 6,00...8,00
B04
```

```
1st version
                                                     Charge press. hPa : -
              1/min: 700
                                                                  1/min : 500
Speed
                                                     Speed
Charge press. hPa : 900
                                                     Del.quantity cm3/ : 146,0...150,0
Del.quantity cm3/: 197.0...199.0
1000H:: (194.0...202.0)
Dispersion cm3/: 7.0
1000H:: 10.0
                                                                  1000H.: (144,0...152,0)
                                                     ROTATIONAL-SPEED LIMITATION
                                                     1st version
HIGHEST RATED SPEED
                                                     1mm control-rod travel less than
1st version
                                                      full-load trav.mm: 12,90
Control-lever
                                                                 1/min: 990...1000
 position degrees: 56...64
                                                     Speed
                                                     STARTING FUEL DELIVERY
Testing:
1st c-rod trav.mm : 12,90
  Speed 1/min: 990...1000
2nd c-rod trav.mm : 4,00
                                                                  1/min : 100
                                                     Speed
             1/min : 1110...1140
1/min : 1250
                                                    Del.quantity cm3/: 240,0...290,0
  Speed
4th speed
                                                                  1000H.: (-)
                   : 0.00...1.00
  C-rod trav.mm
                                                     Contr.-rod trav.mm: 20,00...21,00
                                                    LOW IDLE
LOWEST RATED SPEED I
Control-lever
 position degrees: 6...14
                                                     Speed
                                                                  1/min : 225
                                                     Contr.-rod trav.mm: 4,70...4,90
                                                    Del.quantity cm3/: 14,0...18,0
Testing:
             1/min : 100
                                                                  1000H.: (-)
Speed
                                                                  cm3/: 3.0
1000H: 6.0
C-rod trav.mm min : 6,20
Speed 1/min : 225
                                                     Dispersion
C-rod trav.mm : 4,70...4,90
            nm : 2.00
1/min : 330...390
C-rod trav.mm
                                                    Remarks:
                                                    Delivery-valve spring pre-tension
Speed
                                                     3.2...3.4 mm.
                                                    Permissible alteration of 3.0...3.5 mm
 compensator (LDA,ADA,ALDA)
                                                    Because of flattening, set the spring
                                                    preload on new delivery-valve holders
                                                     to 2.9...3.1 mm.
1st version
Setting
             1/min : 500
Speed
Pressure
            hPa : 900
Contr.-rod trav.mm: 13,90...14,00
                                                    ADDITIONAL INFORMATION
Measurement
             1/min : 500
Speed
1st pressure hPa
C-rod trav.mm : 11,00...11,10
2nd pressure hPa : 335
                                                    Check and set without ROBO diaphragam
                  : 13,10...13,20
: 215
 C-rod trav.mm
3rd pressure hPa
                   : 11,60...11,80
  C-rod trav.mm
                                                    For comb. with letter index see
                                                    VDT-I-400/116.
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press, hPa : 900
             1/min : 950
                                                    For sealing see VDT-I-400/117.
Speed
Del.quantity cm3/ : 190,0...198,0
             1000H.: (188,0...200,0)
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805

Test specifications approved by Scania on 1986-06-09
Start of delivery - engine: 22° before TDC at control-rod travel = 6.0...
8.0 mm
Engine firing sequence: 1-5-4-2-6-3-7-8

```
Cam sequence : 1-2-7-3-4-5-6-8
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                    : SCA 14.2 D1
: 27.8.87
                                                       SD ang. spacing CS: 0-45-90-135-180-225-
Test sheet
Edition
                                                                              270-315
                                                       Tolerance + - 0: 0,50 (0,75)
                    : 9.86
Superceeded
Calibrating oil
                    : ISO-4113
                                                       SD mark cyl. no. : 1
                    : 0 402 648 811
Combination no.
                                                       START OF DELIVERY DIFFERENCE
Injection pump
Pump designation : PE8P12OA920/4LS7008
                                                       betw.c-rod trav.mm: 7,00...13,90
                                                       & c-rod tray max. : 21,00
Difference CS : 1,45...2,15
EP type number
                    : 0 412 628 803
Governor
Governor design. : RQV275...950PA547-4
Governer no. : 0 421 813 435
                                                       BASIC SETTING
                                                                     1/mi: 700
Customer-spec. information
                                                       1st speed
                    : SAAB-SCANIA
Customer
                                                       Contr.-rod trav.mm: 13,90...14,00
                    : DSC14 01
Engine
                                                       Del.quantity cm3/: 19,7...19,9
TEST BENCH REQUIREMENTS
                                                                      100H.: (19,4...20,2)
Calibrating-oil inlet temp. °C
                    : 38...42
                                                                      cm3/:0.7
                                                       Dispersion
Overflow valve
                                                                      100H.: (1,0)
                    : 1 417 413 025
                                                       2nd speed
                                                                      1/min: 275
                                                       Contr.-rod trav. m: 4,70...4,90
Dispersion cm3/: 0,3
100H.: (0,6)
Inlet press., bar: 1.50
Calibrating nozzle-holder
               : 1 688 901 019
 assembly
                                                       (B) Setting of injection pump with externally-mounted governor
Opening
 pressure, bar
                    : 207...210
                                                       SLEEVE TRAVELS
                                                       1st speed 1/min: 275
Perforated-plate
                                                       Sleeve travel mm: 1,90...2,10
2nd speed 1/min: 430
Sleeve travel mm: 3,70...4,00
3rd speed 1/min: 500
 diameter mm
                    : 0.8
Test inj. tubing : 1 680 750 015
                                                        Sleeve travel mm: 4,80...5,00
                                                       4th speed 1/min: 1000
Sleeve travel mm: 7,60...7,80
Outside diameter
x Wall thickness
                                                       5th speed 1/min: 1180
x Length mm
                    : 6,00X1,50X600
                                                         Sleeve travel mm: 9,20...9,40
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                       SLEEVE POSITION
                                                       Control-lever position
                                                                    Degree: -1
1/min: 1100
    per values
                                                       Speed
START OF DELIVERY
                                                       Cont.-rod travelmm: 15,20...17,80
Test pressure, bar: 25...27
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
                    : 4,50...4,60
Prestroke mm
                    : (4,45...4,65)
                                                       1st version
Contr.-rod trav.mm: 6,00...8,00
                                                       Speed
                                                                     1/min: 700
B07
```

Charge press. hPa : 900 Del.quantity cm3/: 146,0...150,0 Del.quantity cm3/: 197.0...199.0 1000H.: (194.0...202.0) Dispersion cm3/: 7.0 1000H.: (10.0) 1000H.: (144,0...152,0) ROTATIONAL-SPEED LIMITATION 1st version HIGHEST RATED SPEED 1mm control-rod travel less than 1st version Control-lever full-load trav.mm: 12,90 position degrees: 55...63 Speed 1/min : 990...1000 STARTING FUEL DELIVERY Testing: 1st c-rod trav.mm : 12,90 Speed 1/min : 990...1000 2nd c-rod trav.mm : 4.00 Speed 1/min : 1170...1200 1/min : 100 Speed Del.quantity cm3/: 240,0...290,0 4th speed 1/min: 1300 1000H.: (-) C-rod trav.mm : 0,00...1,00 Contr.-rod trav.mm: 20,00...21,00 LOWEST RATED SPEED I LOW IDLE Control-lever position degrees: 5...13 1/min : 275 Speed Contr.-rod trav.mm: 4,70...4,90 Dispersion cm3/: 3,0 Testing: 1000H.: (6,0) Speed 1/min : 100 C-rod trav.mm min: 6,20 Speed 1/min: 275 Delivery-valve spring pre-tension : 4,70...4,90 3.2...3.4 mm. C-rod trav.mm mm : 2,00 1/min : 330...390 Permissible alteration of 3.0...3.5 mmC-rod trav.mm Because of flattening, set the spring Speed preload on new delivery-valve holders to 2.9...3.1 mm. compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 ADDITIONAL INFORMATION Speed Pressure hPa : 900 Contr.-rod trav.mm: 13,90...14,00 Measurement 1/min : 500 Speed Check and set without ROBO diaphragam 1st pressure hPa C-rod trav.mm : 11,00...11,10 ad pressure hPa : 335 2nd pressure hPa C-rod trav.mm : 13,10...13,20 3rd pressure hPa : 215 For comb. With letter index see VDT-I-400/116. C-rod trav.mm 80...11,80 FUEL-DELIVERY CHARACTERISTICS For sealing see VDT-I-400/117. 1st version Charge press. hPa : 900 Speed 1/min : 950 Del.quantity cm3/: 190.0...198.0 1000H.: (188.0...200.0) Speed 1/min: 500 Test specifications approved by Scania on 1986-06-09 Start of delivery - engine: 220 before 608

TDC at control-rod travel = 6.0... 8.0 mm Engine firing sequence: 1-5-4-2-6-3-7-8 **B**09

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                   START OF DELIVERY
                                                   Test pressure, bar: 25...27
Note inst. in remarks column
                                                                      : 5.20...5.30
                                                   Prestroke mm
Test sheet
                   : MB 14,7 A1
                                                                      : (5.15...5.35)
                                                   Contr.-rod trav.mm: 20.00...21.00
                   : 02.06.87
                                                                      : 8- 7- 2- 6- 3- 5-
4- 1
Superceeded
                  : 11.86
                                                   Cam sequence
Calibrating oil : ISO-4113
Combination no.
                  : 0 402 648 812
                                                   SD ang. spacing CS: 0-45-90-135-180-225-
Injection pump
Pump designation : PE8P12OA32OLS7801
                                                                        270-315
                                                   Tolerance + - 0
                                                                      : 0.50 (0.75)
EP type number : 0 412 628 806
Governor
Governor design. : RQ300/1050PA717
                                                   SD mark cyl. no. : 8
Governer no. : 0 421 801 258
                                                   BASIC SETTING
Customer-spec. information
                  : DAIMLER-BENZ
Custamer
                                                                 1/mi: 600
                                                   1st speed
                                                   Contr.-rod trav.mm: 14.80...15.00
Engine
                   : 0M442 LA
1st version kW : 320.0
                                                   Del.quantity cm3/: 21.6...21.8
Speed
             1/min: 2100
                                                                 100H.: (21.3...22.1)
TEST BENCH REQUIREMENTS
                                                   Dispersion
                                                                cm3/:0.5
Calibrating-oil inlet temp. OC
                   : 38...42
                                                                 100H.: (0.9)
Overflow valve
                                                   2nd speed
                                                                1/min: 300
                                                   Contr.-rod trav. m: 6.10...6.70 Del.quantity cm3/: 1.6...2.2
                   : 1 417 413 025
                                                                100H.: (1.3...2.5) cm3/: 0.6
Inlet press., bar : 1.50
                                                   Dispersion
Overflow
                                                                100H.: (1.0)
 quantity min. 1/h: 100...120
                                                   (B) Setting of injection pump with
Calibrating nozzle-holder
                                                       externally-mounted governor
assembly : 1 688 901 019
                                                   SLEEVE TRAVELS
Opening
                                                   1st speed 1/min: 300
                  : 207...210
                                                     Sleeve travel mm: 2.80...3.00
pressure, bar
                                                   2nd speed 1/min: 600
                                                     Sleeve travel mm: 6.00...6.10
Perforated-plate
                                                   3rd speed 1/min: 900
Sleeve travel mm: 6.10...6.20
4th speed 1/min: 1000
 diameter mm
                   : 0.8
Test inj. tubing : 1 680 750 067
                                                     Sleeve travel mm: 6.20...6.30
                                                   5th speed 1/min: 1150
                                                     Sleeve travel mm: 9.30...9.60
Outside diameter
x Wall thickness
x Length mm
                  : 6.00x1.50x1000
                                                   SLEEVE POSITION
                                                   Control-lever position
                                                               Degree: -2
1/min: 600
(A) Injection pump setting values
    Insp. values in parentheses
                                                   Speed
    Set constant delivery quant.
                                                   Cont.-rod travelmm: 19.20...20.80
    per values
                                                   FULL-LOAD DELIV. AT FULL-LOAD STOP
B10
```

1st pressure hPa : 310 1st version C-rod trav.mm : 12.20...12.40 Speed 1/min: 600 2nd pressure hPa : 470 Charge press. hPa : 680 C-rod trav.mm : 13.80...14.00 Del.quantity cm3/: 216.0...218.0 1000H.: (213.0...221.0) 3rd pressure hPa : 820 C-rod trav.mm : 15.00...15.19 cm3/ : 5.00: 1100 Dispersion 4th pressure hPa 1000H.: (9.00) : 16.00...16.10 C-rod trav.mm 5th pressure hPa HIGHEST RATED SPEED C-rod trav.mm : 11.60...11.70 1st version SWITCH-OVER POINT Control-lever position degrees: 36...44 1/min : 220 (240) Speed Setting point: 1/min : 600 FUEL-DELIVERY CHARACTERISTICS Speed Contr.-rod trav.mm: 20.0 Testing: 1st version 1st c-rod trav.mm : 14.70 Charge press. hPa : 1150 Speed 1/min: 1095...1110 1/min : 1050 Speed Del.quantity cm3/: 232.0...235.0 2nd c-rod trav.mm : 4.00 1/min: 1160...1190 1000H.: (229.0...238.0) Speed 4th speed 1/min: 1300 cm3/:8.0Dispersion 1000H.: (12.0) Charge press. hPa : 1150 C-rod trav.mm : 0.00...1.50 1/min: 850 LOWEST RATED SPEED I Speed Del.quantity cm3/: 247.0...251.0 Control-lever 1000H.: (244.0...254.0) position degrees: 9...17 Setting point w/out aux. spring cm3/:8.0Dispersion 1000H.: (12.0) 1/min : 300 Contr.-rod trav.mm: 6.4 ROTATIONAL-SPEED LIMITATION Testing: 1/min : 200 Speed 1st version C-rod trav.mm min : 8.00 1mm control-rod travel less than Speed 1/min : 300 C-rod trav.mm : 6.40 full-load trav.mm: 14.70 C-rod trav.mm : 2.00 Speed 1/min : 1095...1110 1/min : 380...420 Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm : 0.35 2nd speed 1/min : 1050 Speed 1/min : 100 C-rod trav.mm : 15.60...15.80 Del.quantity cm3/: 200.0...220.0 1/min : 850 1000H.: (196.0...224.0) 3rd speed : 16.00...16.20 C-rod trav.mm Remarks: compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 600 Speed ħРа Pressure : 680 Contr.-rod trav.mm: 14.80...15.00 Measurement Speed 1/min : 600

**B11** 

Note inst. in remarks column

Test sheet : SCA 14,0 G : 09.03.87 Edition Superceeded Superceeded : 1.86 Calibrating oil : ISO-4113

Combination no. : 0 402 648 813

Injection pump

Pump designation : PE8P120A920/4LS7108

EP type number : 0 412 628 807

Governor

Governor design. : RQV200...950PA736

Governer no. : 0 421 813 467

Customer-spec. information

Customer : SAAB-SCANIA

Engine : DSC14 01

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

: 4.50...4.60 Prestroke mm : (4.45...4.65) Contr.-rod trav.mm: 6.00...8.00

Cam sequence : 1- 2- 7- 3- 4- 5- 6- 8 1st version 1/min: 700 Speed Charge press. hPa : 900 Del.quantity cm3/: 197.0...199.0 1000H.: (194.0...202.0) Dispersion cm3/: 7.00 1000H.: (10.00) SD ang. spacing CS: 0-45-90-135-180-225-270-315 Tolerance + - 0 : 0.50 (0.75) SD mark cyt. no. : 1 HIGHEST RATED SPEED 1st version START OF DELIVERY DIFFERENCE Control-lever position degrees: 56...64 betw.c-rod trav.mm: 7.00...13.90 & c-rod tray max. : 21.00 Difference CS : 1.45...2.15 Testing: 1st c-rod trav.mm : 12.90 Speed 1/min: 990...1000 2nd c-rod trav.mm : 4.00 BASIC SETTING Speed 1/min: 1110...1140 4th speed 1/min: 1250 1st speed 1/mi: 700 C-rod trav.mm : 0.00...1.00 Contr.-rod trav.mm: 13.90...14.00 LOWEST RATED SPEED I Del.quantity cm3/: 19.7...19.9 Control-lever position degrees: 6...14 100H.: (19.4...20.2) Testing: cm3/:0.7Dispersion 1/min : 100 Speed C-rod trav.mm min : 6.20 100H.: (1.0) Speed 1/min : 225 C-rod trav.mm : 4.70...4.90 C-rod trav.mm : 2.00 1/min: 225 2nd speed Contr.-rod trav. m: 4.60...4.80 Del.quantity cm3/: 1.4...1.8 100H.: (-) Speed 1/min: 330...390 compensator (LDA, ADA, ALDA) cm3/: 0.3 100H.: (0.6) Dispersion 1st version (B) Setting of injection pump with externally-mounted governor Settina Speed 1/min : 500 Pressure hPa : 900 Contr.-rod trav.mm: 13.90...14.00 SLEEVE TRAVELS 1st speed 1/min: 225 Sleeve travel mm: 1.30...1.50 2nd speed 1/min: 270 Measurement 1/min : 500 Speed Steeve travel mm: 1.80...2.10

3rd speed 1/min: 360

Steeve travel mm: 2.60...3.00

4th speed 1/min: 990

Steeve travel mm: 7.80...8.00 1st pressure hPa : -C-rod trav.mm : 11.00...11.10 2nd pressure hPa : 335 C-rod trav.mm : 13.20...13.30 5th speed 1/min: 1120 3rd pressure hPa : 215 Sleeve travel mm: 9.40...9.70 C-rod trav.mm : 11.60...11.80 FUEL-DELIVERY CHARACTERISTICS SLEEVE POSITION Control-lever position Degree: -1 Speed 1/min: 1050 Cont.-rod travelmm: 15.20...17.80 1st version Charge press. hPa : 900 Speed 1/min: 950 FULL-LOAD DELIV. AT FULL-LOAD STOP

813

Del.quantity cm3/: 190.0...198.0 1000H.: (188.0...200.0) Charge press. hPa : -1/min: 500 Speed Del.quantity cm3/: 146.0...150.0 1000H.: (144.0...152.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 12.90 Speed 1/min : 990...1000 STARTING FUEL DELIVERY Speed 1/min : 100
Del.quantity cm3/ : 240.0...290.0 1000H.: (-) Contr.-rod trav.mm: 20.00...21.00 LOW IDLE 1/min : 225 Speed Contr.-rod trav.mm: 4.70...4.90 Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm. ADDITIONAL INFORMATION Check and set without ROBO diaphragam For comb. with letter index see VDT-1-400/116. For sealing see VDT-I-400/117. Test specifications approved by Scania

814

on 1985-02-11 Start of delivery - engine: 22° before TDC at control-rod travel = 6.0... 8.0 mm Engine firing sequence: 1-5-4-2-6-3-7-8

```
: 1- 2- 3- 4- 7- 8-
5- 6
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                        Cam sequence
Note inst. in remarks column
Test sheet
Edition
Superceeded
                   A 8,85 MWM :
                   : 09.03.87
                                                        SD ang. spacing CS: 0-30-90-120-225-255-
                   : 10.85
                                                                               315-345
                                                        Tolerance + - 0
Calibrating oil : ISO-4113
                                                                             : 0.50 (0.75)
Combination no. : 0 402 648 814
                                                        BASIC SETTING
                                                                        1/mi: 800
Injection pump
                                                        1st speed
Pump designation : PE8P120A500/5RS7109
                                                        Contr.-rod trav.mm: 14.90...15.00
EP type number
                  : 0 412 628 809
Governor
Governor design. : RQV300...1150PA756
Governer no. : 0 421 813 486
                                                        Del.quantity cm3/: 26.0...26.2
                                                                       100H.: (25.7...26.5)
Customer-spec. information
Customer
                                                                       cm3/ : 0.5
                   : MWM
                                                        Dispersion
                                                                       100H.: (0.9)
                     : TBD234V16
Engine
TEST BENCH REQUIREMENTS
                                                        2nd speed
                                                                       1/min: 300
                                                        Contr.-rod trav. m: 6.50...6.70
Del.quantity cm3/: 3.0...4.0
100H.: (2.7...4.3)
Dispersion cm3/: 0.6
Calibrating-oil inlet temp. C
                     : 38...42
Overflow valve
                                                                       100H.: (1.0)
                     : 1 417 413 025
                                                        (B) Setting of injection pump with
                                                            externally-mounted governor
Inlet press., bar : 1.50
                                                        SLEEVE TRAVELS
Calibrating nozzle-holder
                                                        1st speed 1/min: 300
Sleeve travel mm: 1.30...1.40
 assembly : 1 688 901 019
                                                        2nd speed 1/min: 360
Opening
                    : 207...210
                                                          Sleeve travel mm: 1.60...2.10
 pressure, bar
                                                        3rd speed 1/min: 560
Sleeve travel mm: 2.50...2.90
4th speed 1/min: 1190
Sleeve travel mm: 8.30...8.40
Perforated-plate
diameter mm
                     : 0.8
                                                        5th speed 1/min: 1280
                                                          Sleeve travel mm: 9.60...9.90
Test inj. tubing : 1 680 750 067
Outside diameter
                                                        SLEEVE POSITION
x Wall thickness
                                                        Control-lever position
                   : 6.00x1.50x1000
                                                                     Degree: -1
1/min: 1200
x Length mm
                                                        Speed
                                                        Cont.-rod travelmm: 15.20...17.80
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                        HIGHEST RATED SPEED
    per values
                                                        1st version
                                                        Control-lever
START OF DELIVERY
                                                         position degrees: 52...60
Test pressure, bar: 25...27
                                                        Testing:
                     ; 5.20...5.30
                                                        13t c-rod trav.mm : 13.90
Prestroke mm
                                                        $peed 1/min: 1190...1200
2nd c-rod trav.mm: 4.00
                     : (5.15...5.35)
Contr.-rod trav.mm: 9.00...12.00
```

**B15** 

```
1/min: 1270...1300
  Speed
            1/min: 1400
4th speed
  C-rod trav.mm
                  : 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 14...22
Testing:
            1/min : 100
Speed
C-rod trav.mm min: 8.00
           1/min : 300
Speed
                : 6.50...6.70
C-rod trav.mm
CONSTANT REGULATION
            1/min : 300...580
Speed
 compensator (LDA,ADA,ALDA)
1st version
Setting
            1/min: 500
Speed
Pressure
           hPa : 900
Contr.-rod trav.mm: 14.90...15.00
Measurement
            1/min : 500
Speed
1st pressure hPa : -
                  9.30...9.50
  C-rod trav.mm
2nd pressure hPa : 625
C-rod trav.mm : 14.70...14.80
3rd pressure hPa : 250
                  : 11.30...11.50
  C-rod trav.mm
SWITCH-OVER POINT
Speed
            1/min : 220 (240)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 13.90
Speed
           1/min : 1190...1200
STARTING FUEL DELIVERY
            1/min : 100
Speed
Del.quantity cm3/: 200.0...240.0
            1000H.: (-)
Remarks:
Full-load delivery not known. Set
according to engine test report.
```

Pump runs in tandem

APPLICATION Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence : 1-2-7-3-4-5-6-8 Note inst. in remarks column SD ang. spacing CS: 0-45-90-135-180-225-: SGA 14.2 D2 : 26.8.87 Test sheet Edition 270-315 Tolerance + - 0 : 0,50 (0,75) Superceeded : 9.86 : ISO-4113 Calibrating oil SD mark cyl. no. : 1 Combination no. : 0 402 648 815 START OF DELIVERY DIFFERENCE Injection pump Pump designation : PEBP120A920/4LS7008X betw.c-rod trav.mm: 7,00...12,80 & c-rod tray max. : 21.00 Difference CS : 1.05...1.75 EP type number : 0 412 628 812 Governor Governor design. : RQV20C...950PA547-6 Governer no. : 0 421 813 499 BASIC SETTING 1st speed 1/mi: 700 Customer-spec. information Customer : SAAB-SCANIA Contr.-rod trav.mm: 12,80...12,90 : DSC14 02 Engine Del.quantity cm3/: 18,3...18,5 TEST BENCH REQUIREMENTS 100H.: (18,0...18,8) Calibrating-oil inlet temp. °C : 38...42 cm3/:0.7Dispersion Overflow valve 100H.: (1,0) : 1 417 413 025 2nd speed 1/min: 225 Contr.-rod trav. m: 4,70...4,90 Del.quantity cm3/: 1,4...1,8 Inlet press., bar: 1.50 100H.: (-) cm3/: 0,3 Calibrating nozzle-holder : 1 688 901 019 assembly Dispersion 100H.: (0,6) Opening (B) Setting of injection pump with : 207...210 pressure, bar externally-mounted governor Perforated-plate SLEEVE TRAVELS diameter mm : 0,8 1st speed 1/min: 225 Sleeve travel mm: 1,30...1,40 2nd speed 1/min: 260 Test inj. tubing : 1 680 750 015 Sleeve travel mm: 1,70...90 3rd speed 1/min: 360 Outside diameter Sleeve travel mm: 2,60...3,00
4th speed 1/min: 1000
Sleeve travel mm: 7,90...9,00
5th speed 1/min: 1110 x Wall thickness : 6,00x1,50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Sleeve travel mm: 9,30...9,50 Set constant delivery quant. per values \_\_\_\_ SLEEVE POSITION Control-lever position START OF DELIVERY Degree: -1 17min: 1040 Test pressure, bar: 25...27 Cont.-rod travelmm: 15,20...17,80 Prestroke mm 4,50...4,60 : (4,45...4,65) FULL-LOAD DELIV. AT FULL-LOAD STOP Contr.-rod trav.mm: 6,00...8,00 **B17** 

1st version ROTATIONAL-SPEED LIMITATION 1/min: 700 Speed Charge press. hPa : 900 1st version Del.quantity cm3/: 183.0...185.0 1000H.: (180.0...188.0) Dispersion cm3/: 7.0 1000H.: (10.0) 1mm control-rod travel less than full-load trav.mm: 11,80 Speed 1/min : 990...1000 HIGHEST RATED SPEED STARTING FUEL DELIVERY 1st version Control-lever position degrees: 55...63 Speed 1/min : 100 Del.quantity cm3/: 240,0...290,0 Testing: 1000H.: (-) 1st c-rod trav.mm : 11,80 Contr.-rod trav.mm: 20,00...21,00 Speed 1/min: 990...1000 2nd c-rod trav.mm : 4,00 LOW IDLE 1/min : 1090...1120 1/min : 1250 Speed Speed 1/min: 225 Contr.-rod trav.mm: 4,70...4,90 4th speed C-rod trav.mm : 0,00...1,00 Del.quantity cm3/: 14,0...18,0 1000H.: (-) LOWEST RATED SPEED I cm3/:3,0Control-lever Dispersion 1000H.: (6.0) position degrees: 6...14 Testing: Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm. 1/min : 100 Speed C-rod trav.mm min : 6.20 Speed 1/min : 225 Permissible alteration of 3.0...3.5 mm C-rod trav.mm : 4,70...4,90 Because of flattening, set the spring mm : 2,00 1/min : 330...390 C-rod trav.mm preload on new delivery-valve holders to 2.9...3.1 mm. Speed compensator (LDA,ADA,ALDA) 1st version ADDITIONAL INFORMATION Setting 1/min : 500 Speed Pressure hPa : 900 Contr.-rod trav.mm: 12,80...12,90 Check and set without ROBO diaphragam Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 11,00...11,10 For comb. With letter index see VDT-I-400/116. FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 900 For sealing see VDT-I-400/117. 1/min : 950 Speed Del.quantity cm3/: 177.0...185.0 1000H.: (175.0...187.0) 1/min : 500 Speed Del.quantity cm3/: 146.0...150.0 1000H.: (144.0...152.0) Scania test specifications taken over on May 3, 1985 Start of delivery - engine: 22° before **B18** 

TDC at control-rod travel = 6.0... 8.0 mm Engine firing sequence: 1-5-4-2-6-3-7-8

BOSCH INJ. PUMP TEST SPECIFICATIONS START OF DELIVERY Test pressure, bar: 25...27 Note inst. in remarks column : 5.20...5.30 Prestroke mm Test sheet : MB 14,7 A4 : (5.15...5.35) Edition : 14.08.87 Contr.-rod trav.mm: 20.00...21.00 Superceeded Cam sequence : 8- 7- 2- 6- 3-5~ Calibrating oil : ISO-4113 Combination no. : 0 402 648 817 Injection pump SD ang. spacing CS: 0-45-90-135-180-225-Pump designation : PE8P12OA32OLS7801 270-315 EP type number Tolerance + - 0 : 0 412 628 806 : 0.50 (0.75) Governor Governor design. : RQ300/1050PA762-5 SD mark cyl. no. : 8 Governer no. : D 421 801 399 BASIC SETTING Customer-spec. information Customer : DAIMLER-BENZ 1/mi: 600 1st speed : 0M442 A Engine Contr.-rod trav.mm: 13.90...14.00 1st version kW : 260.0 Del.quantity cm3/: 19.6...19.8 Speed 1/min: 2100 100H.: (19.3...20.1) TEST BENCH REQUIREMENTS Dispersion cm3/:0.5Calibrating-oil inlet temp. °C : 38...42 100H.: (0.9) Overflow valve 1/min: 300.0 2nd speed : 1 417 413 025 Contr.-rod trav. m: 6.2...6.6 Del.quantity cm3/ : 1.6...2.2 100H.: (1.3...2.5) cm3/: 0.6 Inlet press., bar : 1.50 Dispersion 100H.: (1.0) Overflow quantity min. 1/h: 100...120 (B) Setting of injection pump with Calibrating nozzle-holder externally-mounted governor assembly : 1 688 901 019 SLEEVE TRAVELS Opening 1st speed 1/min: 300 pressure, bar : 207...210 Sleeve travel mm: 2.20...2.40 2nd speed 1/min: 600 Steeve travel mm: 5.90...6.10 3rd speed 1/min: 870 Perforated-plate diameter mm : 0.8 Sleeve travel mm: 6.10...6.30 th speed 1/min: 1050 Sleeve travel mm: 6.70...6.90 4th speed Test inj. tubing : 1 680 750 067 5th speed 1/min: 1170 Sleeve travel mm: 9.20...9.80 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm SLEEVE POSITION Control-lever position Degree: 108...110 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. 17min: 600 Cont.-rod travelmm: 19.20...20.80 per values FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version 1/min: 600 Speed 1st pressure hPa : 300 Charge press. hPa : 650 C-rod trav.mm : 12.20...12.40 Del.quantity cm3/: 196.0...198.0 1000H.: (193.0...201.0) Dispersion cm3/: 5.00 1000H.: (9.00) 2nd pressure hPa : 400 C-rod trav.mm : 13.20...13.50 : 850 3rd pressure hPa : 14.00...14.10 C-rod trav.mm 4th pressure hPa HIGHEST RATED SPEED C-rod tray.mm : 11.50...11.60 1st version SWITCH-OVER POINT Control-lever position degrees: 36...44 1/min : 220 (240) Speed Setting point: FUEL-DELIVERY CHARACTERISTICS 1/min : 600 Speed Contr.-rod trav.mm: 20.0 Testing: 1st version 1st c-rod trav.mm : 11.80 Charge press. hPa : 1050 1/min : 1095...1110 1/min: 1050 Speed Speed Del.quantity cm3/: 175.0...178.0 1000H.: (172.0...181.0) 2nd c-rod trav.mm : 4.00 1/min: 1170...1200 Speed cm3/: 8.0 1000H.: (12.0) 1/min : 1300 4th speed Dispersion . 0.00...1.50 C-rod trav.mm Charge press. hPa : 1050 LOWEST RATED SPEED I Speed 1/min : 700 Del.quantity cm3/ : 209.0...213.0 Control-lever position degrees: 10...18 1000H.: (206.0...216.0) cm3/: 8.0 1000H.: (12.0) Setting point w/out aux. spring Dispersion 1/min : 300 Speed Charge press. hPa : 1050 Contr.-rod trav.mm: 6.3 1/min : 850 Speed Del.quantity cm3/: 203.0...207.0 1000H.: (200.0...210.0) Testing: 1/min : 200 Speed cm3/: 8.0 1000H.: (12.0) C-rod trav.mm min : 8.00 Dispersion 1/min : 300 Speed : 6.30 C-rod trav.mm Charge press. hPa : mm : 2.00 1/min : 380...420 C-rod trav.mm Speed 1/min : 500 Speed ROTATIONAL-SPEED LIMITATION TORQUE CONTROL Dimension a mm : 0.75 1st version 2nd speed 1/min : 1050 1mm control-rod travel less than C-rod trav.mm : 12.60...12.80 3rd speed 1/min: 850 full-load trav.mm: 11.80 C-rod trav.mm : 13.70...13.90 1/min : 1095...1110 Speed 4th speed 1/min: 700 STARTING FUEL DELIVERY : 14.20...14.50 C-rod trav.mm compensator (LDA,ADA,ALDA) Speed 1/min : 100 Del.quantity cm3/: 175.0...190.0 1000H.: (171.0...194.0) 1st version Setting 1/min : 600 Remarks: Speed hPa : 650 Pressure Contr.-rod trav.mm: 13.90...14.00

Speed

1/min : 600

Measurement

Note inst. in remarks column

Test sheet : SCA 14,0 G1 : 14.08.87 Edition Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 648 822

Injection pump

Pump designation : PE8P120A920/4L87108

EP type number : 0 412 628 807

Governor

Governor design. : RQV275...950PA736-2

Governer no. : 0 421 813 616

Customer-spec. information

: SAAB-SCANIA Customer

: DSC14 01 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Calibrating nozzle-holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

: 4.50...4.60 Prestroke mm

: (4.45...4.65)

Contr.-rod trav.mm: 6.00...8.00

```
Cam sequence : 1- 2- 7- 3- 4- 5- 6- 8
                                                           1st version
                                                                           1/min: 700
                                                           Speed
                                                           Charge press. hPa: 900
Del.quantity cm3/: 197.0...199.0
1000H: (194.0...202.0)
Dispersion cm3/: 7.00
SD ang. spacing CS: 0-45-90-135-180-225-
                        270-315
Tolerance + - 0
                                                                          1000H.: (10.00)
                      : 0.50 (0.75)
SD mark cyl. no. : 1
                                                           HIGHEST RATED SPEED
                                                           1st version
START OF DELIVERY DIFFERENCE
                                                           Control-lever
                                                            position degrees: 55...63
betw.c-rod trav.mm: 7.00...14.20 & c-rod trav max. : 21.00 Difference CS : 1.65...2.35
                                                           Testing:
                                                           1st c-rod trav.mm : 12.90
Speed 1/min : 990...1000
                                                           2nd c-rod trav.mm : 4.00
BASIC SETTING
                                                           Speed 1/min: 1165...1195
4th speed 1/min: 1300
1st speed 1/mi: 700
                                                             C-rod trav.mm : 0.00...1.00
Contr.-rod trav.mm: 13.90...14.00
                                                           LOWEST RATED SPEED I
Del.quantity cm3/ : 19.7...19.9
                                                           Control-lever
                                                            position degrees: 6...14
                100H.: (19.4...20.2)
                                                           Testing:
                                                                         1/min : 100
Dispersion
                cm3/:0.7
                                                           Speed
                                                           C-rod trav.mm min: 5.90
Speed 1/min: 275
                100H.: (1.0)
                                                           C-rod trav.mm : 4.40...4.60
C-rod trav.mm : 2.00
Speed 1/min : 320...380
               1/min: 275.0
2nd speed
Contr.-rod trav. m: 4.6...4.8
Del.quantity cm3/: 1.4...1.8
                100H.: (-)
                                                            compensator (LDA,ADA,ALDA)
                cm3/: 0.3
100H.: (0.6)
Dispersion
                                                           1st version
(B) Setting of injection pump with
                                                           Setting
    externally-mounted governor
                                                                         1/min : 500
                                                           Speed
                                                           Pressure hPa : 900
                                                           Contr.-rod trav.mm: 13.90...14.00
SLEEVE TRAVELS
1st speed 1/min: 275
Sleeve travel mm: 1.40...1.50
2nd speed 1/min: 350
Sleeve travel mm: 2.50...2.90
3rd speed 1/min: 550
Sleeve travel mm: 5.00...5.30
                                                           Measurement
                                                           Speed
                                                                         1/min : 500
                                                           1st pressure hPa : -
                                                             C-rod trav.mm : 11.00...11.10
4th speed 1/min: 990
Sleeve travel mm: 7.60...7.80
                                                           2nd pressure hPa : 335
                                                             C-rod trav.mm : 13.10...13.20
5th speed 1/min: 1100
Sleeve travel mm: 8.50...8.80
                                                           3rd pressure hPa : 215
                                                             C-rod trav.mm
                                                                                : 11.60...11.80
SLEEVE POSITION
                                                           FUEL-DELIVERY CHARACTERISTICS
Control-lever position
              Degree: -1
               17min: 1080
Speed
                                                           1st version
Cont.-rod travelmm: 15.20...17.80
                                                           Charge press. hPa : 900
                                                           Speed 1/min: 950
FULL-LOAD DELIV. AT FULL-LOAD STOP
```

**B23** 

Del.quantity cm3/: 190.0...198.0 1000H.: (188.0...200.0) Speed 1/min: 500 Del.quantity cm3/: 146.0...150.0 1000H.: (144.0...152.0)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 12.90 peed 1/min: 990...1000 Speed

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 240.0...290.0 1000H.: (-) Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min: 275 Contr.-rod trav.mm: 4.40...4.60

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 2.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

for sealing see VDT-I-400/117.

22° before top dead center with control-rod travel 6.0...8.0 mm.

Firing sequence of engine: 1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 1-8-5-4-7-2-Cam sequence Note inst. in remarks column Test sheet : MWM 14,4 B : 09.03.87 SD ang. spacing CS: 0-30-90-120-180-210-: 10.85 270-300 Superceeded Tolerance + - 0 Calibrating oil : ISC-4113 : 0.50 (0.75) Combination no. : 0 402 648 823 BASIC SETTING Injection pump 1/mi: 800 1st speed Pump designation : PE8P12OA520/5RS7115 Contr.-rod trav.mm: 14.90...15.00 EP type number : 0 412 628 813 Governor Governor design. : RQV300...1150PA756 Del.quantity cm3/: 26.0...26.2 Governer no. : 0 421 813 486 100H.: (25.7...26.5) Customer-spec. information cm3/:0.5Customer : MWM Dispersion Engine : TBD234V8 100H.: (0.9) TEST BENCH REQUIREMENTS 2nd speed 1/min: 300 Contr.-rod trav. m: 6.20...6.40 Calibrating-oil inlet temp. C Del.quantity cm3/: 3.0...4.0 : 38 . . . 42 100H.: (-) cm3/: 0.6 100H.: (1.0) Dispersion Overflow valve : 1 417 413 025 (B) Setting of injection pump with externally-mounted governor Inlet press., bar : 1.50 SLEEVE TRAVELS Calibrating nozzle-holder . 1 688 901 019 assembly 1st speed 1/min: 300 Sleeve travel mm: 1.30...1.40 2nd speed 1/min: 350
Sleeve travel mm: 1.60...2.00
3rd speed 1/min: 560
Sleeve travel mm: 2.50...2.90 Opening : 207...210 pressure, bar Perforated-plate : 0.8 4th speed 1/min: 1190 diameter mm Sleeve travel mm: 8.30...8.40 5th speed 1/min: 1280 Sleeve travel mm: 9.50...9.90 Test inj. tubing : 1 680 750 067 SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 : 6.00x1.50x1000 x Length mm 17min: 1200 Speed Cont.-rod travelmm: 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. HIGHEST RATED SPEED per values 1st version Control-lever START OF DELIVERY position degrees: 52...60 Test pressure, bar: 25...27 Testing: Prestroke mm : 5.20...5.30 1st c-rod trav.mm: 13.90 Speed 1/min: 1190...1200 : (5.15...5.35) Contr.-rod trav.mm: 9.00...12.00 2nd a-rod trav.mm : 4.00 825

```
1/min : 1270...1300
1/min : 1400
  Speed
4th speed
  C-rod trav.mm : 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 14...22
Testing:
            1/min : 100
Speed
C-rod trav.mm min : 8.00
           1/min : 300
Speed
C-rod trav.mm
                 : 6.50...6.70
CONSTANT REGULATION
Speed
           1/min : 300...580
 compensator (LDA,ADA,ALDA)
1st version
Setting
           1/min : 500
Speed
Pressure
           hPa : 900
Contr.-rod trav.mm: 14.90...15.00
Measurement
           1/min : 500
Speed
1st pressure hPa : -
  C-rod trav.mm : 9.30...9.50
2nd pressure hPa : 625
  C-rod trav.mm : 14.70...14.80
3rd pressure hPa : 250
  C-rod trav.mm : 11.30...11.50
SWITCH-OVER POINT
           1/min : 220 (240)
Speed
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 13.90
          1/min : 1190...1200
Speed
STARTING FUEL DELIVERY
Remarks:
Full-load delivery not known. Set
according to engine test report.
```

APPLICATION Installation 2300

lea-

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                   START OF DELIVERY
                                                   Test pressure, bar: 25...27
Note inst. in remarks column
                                                   Prestroke mm
                                                                      : 5.20...5.30
Test sheet
                                                                      : (5.15...5...5)
                   : MB 14,7 B
                  : 14.11.86
Edition
                                                   Contr.-rod trav.mm: 20.00...21.00
                                                   Cam sequence : 8- 7- 2- 6- 3-
                                                                                         5-
Superceeded
                  : 2.86
Calibrating oil
                 : ISO-4113
Combination no. : 9 402 648 824
                                                   SD ang. spacing ^{\circ} CS: 0-45-90-135-180-225-
Injection pump
Pump designation : PEBP120A320LS7801
                                                                        270-315
EP type number
                  : 0 412 628 806
                                                   Tolerance + - 0
                                                                      : 0.50 (0.75)
Governor
Governor design. : RQV300..1050PA797
                                                   SD mark cyl. ro. : 8
Governer no.
                  : 0 421 813 532
                                                   BASIC SETTING
Customer-spec. information
Customer
                  : DAIMLER-BENZ
                                                   1st speed
                                                                1/mi: 600
                                                   Contr.-rod trav.mm: 14.80...15.00
Engine
                  : 0M442 LA
1st version kW : 320.0
                                                   Del.quantity cm3/: 21.6...21.8
             1/min: 2300
Speed
                                                                100H.: (21.3...22.1)
TEST BENCH REQUIREMENTS
                                                                cm3/:0.5
                                                   Dispersion
Calibrating-oil inlet temp. °C
                   : 38...42
                                                                100H.: (0.9)
Overflow valve
                                                                1/min: 300
                                                   2nd speed
                   : 1 417 413 025
                                                   Contr.-rod trav. m: 6.20...6.60
                                                  Del.quantity cm3/: 1.6...2.2
100H:: (1.3...2.5)
Dispersion cm3/: 0.6
100H:: (1.0)
Inlet press., bar : 1.50
Overflow
 quantity min. 1/h: 100...120
                                                   (B) Setting of injection pump with
Calibrating nozzle-holder
                                                       externally-mounted governor
            : 1 688 901 019
 assembly
                                                   SLEEVE TRAVELS
                                                   1st speed 1/min: 300
Opening
                                                     Sleeve travel mm: 1.20...1.40
pressure, bar
                  : 207...210
                                                   2nd speed 1/min: 600
                                                     Sleeve travel mm: 4.90...5.10
Perforated-plate
                                                   3rd speed 1/min: 1075
Sleeve travel mm: 7.40...7.60
diameter mm
                  : 0.8
                                                   4th speed 1/min: 1100
Test inj. tubing : 1 680 750 067
                                                     Sleeve travel mm: 8.00...8.20
                                                   5th speed 1/min: 1150
Sleeve travel mm: 9.00...9.20
Outside diameter
× Wall thickness
                 : 6.00x1.50x1000
                                                   SLEEVE POSITION
x Length mm
                                                  Control-lever position
(A) Injection pump setting values
                                                               Degree: -1
                                                                17min: 1090
    Insp. values in parentheses
                                                  Cont.-rod travelmm: 16.50...18.00
    Set constant delivery quant.
   per values
                                                  FULL-LOAD DELIV. AT FULL-LOAD STOP
```

1st version 1/min: 600 Speed Charge press. hPa : 680 Del.quantity cm3/: 216.0...218.0 1000H.: (213.0...221.0) Dispersion cm3/: 5.00 1000H.: (9.00) Speed HIGHEST RATED SPEED 1st version Control-lever position degrees: 50...58 Testing: 1st c-rod trav.mm : 14.70 Speed 1/min: 1095...1110 2nd c-rod trav.mm : 4.00 1/min : 1160...1190 Speed 1/min : 1300 4th speed C-rod trav.mm : 0.00...1.50 Speed LOWEST RATED SPEED I Control-lever position degrees: 15...23 Testing: 1/min : 100 Speed C-rod trav.mm min : 7.90 Speed 1/min : 300 C-rod trav.mm : 6.20...6.40 CONSTANT REGULATION Speed Speed 1/min : 300...500 TORQUE CONTROL Dimension a mm : 0.40 1/min : 1050 2nd speed Speed C-rod trav.mm : 15.60...16.00 1/min : 850 3rd speed : 16.00...16.20 C-rod trav.mm Remarks: compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 600 Speed hPa : 680 Pressure Contr.-rod trav.mm: 14.80...25.00 Measurement Speed 1/min : 600 1st pressure hPa : 310 C-rod trav.mm : 12.20...12.40 2nd pressure hPa : 470 : 13.80...14.00 C-rod trav.mm 3rd pressure hPa : 820 C-rod trav.mm : 15.00...15.10

**B28** 

4th pressure hPa : 1100 : 16.00...16.10 C-rod trav.mm 5th pressure hPa : 150 C-rod trav.mm : 11.50...11.70 SWITCH-OVER POINT 1/min : 220 (240) FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 1150 Speed 1/min: 1050
Del.quantity cm3/: 232.0...235.0
1000H.: (229.0...238.0) cm3/:8.0Dispersion 1000H.: (12.0) Charge press. hPa : 1150 1/min : 850 Del.quantity cm3/: 247.0...251.0 1000H.: (244.0...254.0) Dispersion cm3/: 8.0 1000H.: (12.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 14.70 1/min : 1095...1110 STARTING FUEL DELIVERY

1/min : 100 Del.quantity cm3/: 200.0...220.0 1000H.: (196.0...224.0)

Note inst. in remarks column

Test sheet : MB 14,7 A5 Edition : 14.08.87 Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 648 825

Injection pump

Pump designation : PE8P120A320LS7801 EP type number : 0 412 628 806

Governor

Governor design. : RQV300..1050PA797-3

Governer no. : 0 421 813 627

Customer-spec. information

: DAIMLER-BENZ Customer

: 0M442 A Engine

1st version kW : 260.0 1/min: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Overflow

quantity min. 1/h: 100...120

Calibrating nozzle-holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

```
START OF DELIVERY
Test pressure, bar: 25...27
                                                          1st version
                                                                         1/min: 600
                                                          Speed
                                                          Charge press. hPa: 650
Del.quantity cm3/: 196.0...198.0
1000H.: (193.0...201.0)
Dispersion cm3/: 5.00
                     : 5.20...5.30
: (5.15...5.35)
Prestroke mm
Contr.-rod trav.mm: 20.00...21.00
                     : 8- 7- 2- 6- 3- 5-
Cam sequence
                                                                        1000H.: (9.00)
                                                          HIGHEST RATED SPEED
                                                          1st version
SD ang. spacing CS: 0-45-90-135-180-225-
                                                          Control-lever
                        270-315
                                                           position degrees: 115...122
Tolerance + - 0
                     : 0.50 (0.75)
                                                          Testing:
SD mark cyl. no. : 8
                                                          1st c-rod trav.mm : 11.80
                                                            Speed 1/min: 1090...1100
                                                          2nd c-rod trav.mm : 4.00
BASIC SETTING
                                                            Speed 1/min: 1170...1200
                                                          4th speed 1/min: 1300
1st speed 1/mi: 600
                                                            C-rod trav.mm : 0.00...1.50
Contr.-rod trav.mm: 13.90...14.00
                                                          LOWEST RATED SPEED I
Del.quantity cm3/ : 19.6...19.8
                                                          Control-lever
                                                           position degrees: 80...88
               100H.: (19.3...20.1)
                                                          Testing:
Dispersion
               cm3/:0.5
                                                          Speed
                                                                        1/min : 100
                                                          C-rod trav.mm min: 7.70
                                                          Speed 1/min: 300
               160H.: (0.9)
                                                          C-rod trav.mm : 6.20...6.40
               1/min: 300.0
2nd speed
Contr.-rod trav. m: 6.2...6.6
Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.5)
                                                          CONSTANT REGULATION
                                                                        1/min: 300...450
                                                          Speed
               cm3/: 0.6
100H.: (1.0)
                                                          TORQUE CONTROL
Dispersion
                                                          Dimension a mm : 1.40
                                                          2nd speed 1/min : 1050
(B) Setting of injection pump with externally-mounted governor
                                                            C-rod trav.mm : 12.60...12.80
                                                          3rd speed 1/min: 850
                                                          C-rod trav.mm : 13.70...13.90
4th speed 1/min : 700
SLEEVE TRAVELS
                                                            C-rod trav.mm : 14.20...14.40
1st speed 1/min: 300
  Sleeve travel mm: 1.20...1.40
2nd speed 1/min: 600
                                                           compensator (LDA,ADA,ALDA)
Sleeve travel mm: 4.90...5.10

3rd speed 1/min: 1075

Sleeve travel mm: 7.40...7.60

4th speed 1/min: 1100

Sleeve travel mm: 8.00...8.20
                                                          1st version
                                                          Setting
                                                                        1/min : 600
                                                          Speed
                                                          Pressure hPa : 650
Contr.-rod trav.mm: 13.90...14.00
5th speed 1/min: 1150
Sleeve travel mm: 9.00...9.20
SLEEVE POSITION
                                                          Measurement
                                                                        1/min : 600
Control-lever position
                                                          Speed
Degree: -1
Speed 1/min: 1090
Cont.-rod travelmm: 15.20...17.80
                                                          1st pressure hPa : 300
                                                          C-rod trav.mm : 12.20...12.40
2nd pressure hPa : 400
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                            C-rod trav.mm : 13.20...13.50
C02
```

```
3rd pressure hPa
                   : 850
                   : 14.00...14.10
  C-rod trav.mm
4th pressure hPa
                   : 11.50...11.60
  C-rod trav.mm
SWITCH-OVER POINT
            1/min : 220 (240)
Speed
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 1050
             1/min : 1050
Speed
Del.quantity cm3/: 175.0...179.0
             1000H.: (172.0...182.0)
Dispersion
             cm3/:8.0
             1000H.: (12.0)
Charge press. hPa : 1050
Speed
            1/min :
                     700
Del.quantity cm3/ : 209.0...213.0
            1GOOH.: (206.0...216.0)
              cm3/:8.0
Dispersion
             1000H.: (12.0)
Charge press. hPa: 1050
Speed
             1/min : 850
Del.quantity cm3/: 203.0...207.0
             1000H.: (200.P...210.0)
            cm3/: 8.0
1000H.: (12.0)
Dispersion
Charge press. hPa :
             1/min : 500
Speed
Deliquantity cm3/: ?
             1000H.: ?
             cm3/:8.0
Dispersion
             1000H.: (12.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.80
            1/min : 1090...1100
Speed
STARTING FUEL DELIVERY
Speed
            1/min : 100
Del.quantity cm3/: 175.0...190.0
1000H.: (171.0...194.0)
Remarks:
```

C03

Note inst. in remarks column

Test sheet : SCA 14,0 H : 09.03.87 Edition

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 648 826

Injection pump

Pump designation : PE8P12DA92O/4LS7125S EP type number : 0 412 628 815

Governor

Governor design. : RQV200...950PA736-1

: 0 421 813 551 Governer no.

Customer-spec. information

: SAAB-SCANIA Customer

: DSC14 05 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Calibrating nozzle-holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm : (4.95...5.15)

Contr.-rod trav.mm: 9.00...12.00

```
: 1- 2- 7- 3- 4- 5-
6- 8
                                                                Dispersion cm3/ : 6.00
Cam sequence
                                                                                1000H.: (9.00)
                                                                HIGHEST RATED SPEED
                                                                1st version
SD ang. spacing CS: 0-45-90-135-180-225-
                                                                Control-lever
                          270-315
                                                                 position degrees: 54...62
Tolerance + - 0
                        : 0.50 (0.75)
                                                                Testing:
SD mark cyl. no. : 1
                                                                1st c-rod trav.mm : 12.30
                                                                   Speed 1/min: 990...1000
                                                                2nd c-rod trav.mm : 4.00
Speed 1/min : 1100...1130
4th speed 1/min : 1250
BASIC SETTING
              1/mi: 700
1st speed
                                                                   C-rod trav.mm : 0.00...1.00
Contr.-rod trav.mm: 13.30...13.40
                                                                LOWEST RATED SPEED I
Del.quantity cm3/: 20.9...21.1
                                                                Control-lever
                                                                 position degrees: 6...14
                 100H.: (20.6...21.4)
                                                                Testing:
Dispersion
                 cm3/:0.6
                                                                Speed
                                                                                1/min : 100
                                                                C-rod trav.mm min : 6.40
                 100H.: (0.9)
                                                                               1/min : 225
                                                                Speed
                                                                C-rod trav.mm : 4.90...5.10
C-rod trav.mm : 2.00
Speed 1/min : 340...400
2nd speed 1/min: 225
Contr.-rod trav. m: 5.10...5.30
Del.quantity cm3/: 1.6...2.0
100H.: (-)
                                                                 compensator (LDA,ADA,ALDA)
                 cm3/: 0.3
100H.: (0.6)
Dispersion
                                                                1st version
(B) Setting of injection pump with
                                                                Setting
     externally-mounted governor
                                                                               1/min : 500
hPa : 900
                                                                Speed
                                                                Pressure
SLEEVE TRAVELS
                                                                Contr.-rod trav.mm: 13.30...13.40
1st speed 1/min: 225
Sleeve travel mm: 1.30...1.40
                                                                Measurement
2nd speed 1/min: 330
                                                                Speed
                                                                               1/min : 500
Sleeve travel mm: 2.40...2.70

3rd speed 1/min: 420

Sleeve travel mm: 3.10...3.40

4th speed 1/min: 1000

Sleeve travel mm: 7.90...8.10

5th speed 1/min: 1120
                                                                1st pressure hPa : -
                                                                C-rod trav.mm : 11.30...11.40
2nd pressure hPa : 365
C-rod trav.mm : 12.80...12.90
3rd pressure hPa : 215
  Sleeve travel mm: 9.40...9.60
                                                                  C-rod trav.mm : 11.90...12.10
                                                                FUEL-DELIVERY CHARACTERISTICS
SLEEVE POSITION
Control-lever position
               Degree: -1
                 17min: 1040
Speed
                                                                1st version
Cont.-rod travelmm: 15.20...17.80
                                                                Charge press. hPa : 900
                                                                               1/min: 950
                                                                Del.quantity cm3/: 199.0...207.0
1000H.: (197.0...209.0)
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                               Charge press. hPa: -
Speed 1/min: 500
Del.quantity cm3/: 158.0...162.0
1000H.: (156.0...164.0)
1st version
                 1/min: 700
Speed
Charge press. hPa : 900
Del.quantity cm3/: 209.0...211.0
1000H.: (206.0...214.0)
CO5
```

## ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 12.30 1/min: 990...1000 Speed STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 240.0...290.0 1000H.: (-) Contr.-rod trav.mm: 20.00...21.00 LOW IDLE Speed 1/min : 225 Contr.-rod trav.mm: 4.90...5.10 Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm. ADDITIONAL INFORMATION Check and set without ROBO diaphragam For comb. With letter index see VDT-1-400/116. For sealing see VDT-I-400/117. Test specifications approved by Scania on 1986-09-16 Start of delivery - engine: 16° before

Engine firing sequence: 1-5-4-2-6-3-7-8

C06

```
: 1- 2- 7- 3- 4- 5-
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                   Cam sequence
                                                                           6- 8
Note inst. in remarks column
Test sheet
                   : SCA .4.2 B3
: 09.03.87
                                                   SD ang. spacing CS: 0-45-90-135-180-225-270-315
Edition
                  : 9.86
Superceeded
                                                    Tolerance + - 0
Calibrating oil : ISO-4113
                                                                       : 0.50 (0.75)
Combination no.
                   : 0 402 648 828
                                                    SD mark cyl. no. : 1
                                                    BASIC SETTING
Injection pump
Pump designation : PE8P120A920/4LS7003
                 : 0 412 628 801
EP type number
                                                                  1/mi: 970
                                                    1st speed
Governor
Governor design. : RQ1020PA528-3
                                                    Contr.-rod trav.mm: 12.80...12.90
Governer no.
                   : 0 421 801 348
                                                    Del.quantity cm3/: 19.9...20.1
Customer-spec. information
                                                                 100H.: (19.6...20.4)
                   : SAAB-SCANIA
Customer
                   : DSI4 44 DSI14 45
Engine
                                                   Dispersion
                                                                 cm3/:0.6
TEST BENCH REQUIREMENTS
                                                                 100H.: (0.9)
Calibrating-oil inlet temp. DC
                                                    SLEEVE POSITION
                                                    Control-lever position
                   : 38...42
                                                                Degree: 45...47
Overflow valve
                                                    Speed
                                                                 1/min: 600
                   : 1 417 413 025
                                                   Cont.-rod travelmm: 15.20...17.80
                                                   FULL-LOAD DELIV. AT FULL-LOAD STOP
Inlet press., bar : 1.50
Calibrating nozzle-holder
                                                    1st version
              : 1 688 901 019
                                                                 1/min: 970
 assembly
                                                    Speed
                                                   Del.quantity cm3/: 199.0...201.0
                                                                1000H.: (196.0...204.0) cm3/: 6.00
Opening
                  : 207...210
 pressure, bar
                                                   Dispersion
                                                                1000H.: (9.00)
Perforated-plate
                                                   HIGHEST RATED SPEED
                   : 0.8
 diameter mm
                                                    1st version
                                                   Control-lever
Test inj. tubing : 1 680 750 015
                                                    position degrees: 20...28
Outside diameter
                                                   Setting point:
x Wall thickness
                                                               1/min : 600
                                                   Speed
x Length mm
                   : 6.00x1.50x600
                                                   Contr.-rod trav.mm: 16.5
                                                   Testing:
(A) Injection pump setting values
                                                   1st c-rod trav.mm : 11.80
Speed 1/min : 1020...1025
    Insp. values in parentheses
Set constant delivery quant.
    per values
                                                   2nd c-rod trav.mm : 4.00
                                                               1/min: 1066...1081
                                                     Speed
START OF DELIVERY
                                                                1/min : 1120
                                                    4th speed
                                                                      : 0.00...1.00
Test pressure, bar: 25...27
                                                     C-rod trav.mm
                   : 5.00...5.10
: (4.95...5.15)
                                                   ROTATIONAL-SPEED LIMITATION
Prestroke mm
                                                   1st version
Contr.-rod trav.mm: 9.00...12.00
C07
```

```
1mm control-rod travel less than
 full-load trav.mm: 11.80
Speed
          1/min: 1020...1025
STARTING FUEL DELIVERY
HIGH IDLE
Contr.-rod trav.mm: 4.90...5.10
Dispersion cm3/: 4.00
1000H.: (7.00)
Remarks:
ADDITIONAL INFORMATION
Check and set without ROBO diaphragam
For comb. With letter index see
VDT-I-400/116.
For sealing see VDT-I-400/117.
Test specifications approved by Scania
on 1986-06-04
Start of delivery - engine:
DS 14 - 18° before TDC
DSI 14 - 17° before TDC
Engine firing sequence: 1-5-4-2-6-3-7-8
APPLICATION
Generator set
```

```
: 1- 2- 3- 4- 7- 8-
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Cam sequence
                                                                              5- 6
Note inst. in remarks column
Test sheet
                    : NWM 28,8 AZ
                                                      SD ang. spacing CS: 0-30-90-120-225-255-
                    : 02.06.87
Edition
                                                                            315-345
Superceeded
                                                      Tolerance + - 0
                                                                          : 0.50 (0.75)
Calibrating oil
                   : ISO-4113
                    : 0 402 648 829
Combination no.
                                                      BASIC SETTING
Injection pump
                                                      1st speed
                                                                    1/mi: 800
Pump designation : PEBP120A520/SRS7109
                    : 0 412 628 809
                                                      Contr.-rod trav.mm: 14.90...15.00
EP type number
Governor
Governor design.
                   : RQV300...1150PA756-2
: 0 421 813 597
                                                      Del.quantity cm3/: 26.0...26.2
Governer no.
                                                                    100H.: (25.7...26.5)
Customer-spec. information
                                                                    cm3/:0.5
Customer
                    : MWM
                                                      Dispersion
                    : TBD234V16
Engine
                                                                    100H.: (0.9)
                                                                    1/min: 300.0
TEST BENCH REQUIREMENTS
                                                      2nd speed
                                                      Contr.-rod trav. m: 6.5...6.7
Del.quantity cm3/: 3.2...3.8
100H.: (2.9...4.1)
Calibrating-oil
                    : 38...42
                                                                    cm3/:0.6
                                                      Dispersion
                                                                    100H.: (1.0)
Overfinw valve
                    : 1 417 413 025
                                                      (B) Setting of injection pump with
Inlet press., bar : 1.50
                                                          externally-mounted governor
Calibrating nozzle-holder
                                                      SLEEVE TRAVELS
                 : 1 688 901 019
                                                      1st speed 1/min: 300
 assembly
                                                        Sleeve travel mm: 1.30...1.40
Opening
                                                      2nd speed 1/min: 360
                                                      Steeve travel mm: 1.60...2.10
3rd speed 1/min: 560
Steeve travel mm: 2.50...2.90
                    : 207...210
pressure, bar
Per for ated-plate
 diameter mm
                    : 0.8
                                                                   1/min: 1190
                                                      4th speed
                                                        Sleeve travel mm: 8.30...8.40
                                                      5th speed 1/min: 1280
                                                        Sleeve travel mm: 9.60...9.90
Test inj. tubing
                   : 1 680 750 067
                                                      SLEEVE POSITION
Outside diameter
x Wall thickness
                                                      Control-lever position
                                                                   Degree: -1
                   : 6.00x1.50x1000
x Length mm
                                                                    17min: 1200
                                                      Speed
                                                      Cont.-rod travelmm: 15.20...17.80
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
    per values
                                                      1st version
START OF DELIVERY
                                                      Speed
                                                                    1/min: 800
                                                      Charge press. hPa : 900
Test pressure, bar: 25...27
                                                     Del.quantity cm3/: 260.0...262.0
1000H.: (257.0...265.0)
Dispersion cm3/: 5.00
Prestroke mm
                    : 5.20...5.30
                    : (5.15...5.35)
                                                                   1000H.: (9.00)
Contr.-rod trav.mm: 9.00...12.00
CO9
```

HIGHEST RATED SPEED 1st version Control-lever position degrees: 52...60 Testing: 1st c-rod trav.mm : 13.90 1/min : 1190...1200 Speed 2nd c-rod trav.mm : 4.00 1/min : 1285...1315 Speed 4th speed 1/min: 1400 C-rod trav.mm: 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 14...22 Testing: 1/min : 100 Speed C-rod trav.mm min: 8.00 Speed 1/min: 300 C-rod trav.mm : 6.50...6.70 CONSTANT REGULATION 1/min : 300...580 Speed compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 Speed hPa : 900 Pressure Contr.-rod trav.mm: 14.90...15.00 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 9.30...9.50 2nd pressure hPa : 625 C-rod trav.mm : 14.70...14.80 3rd pressure hPa : 250 C-rod trav.mm : 11.30...11.50 SWITCH-OVER POINT Speed 1/min : 220 (240) FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 900 Speed 1/min: 1150 Del.quantity cm3/: 257.0...263.0 1000H.: (254.0...266.0)

Charge press, hPa : -

Speed

C10

1/min : 500

Del.quantity cm3/: 128.0...132.0
1000H.: (126.0...134.0)

ROTATIONAL-SPEED LIMITATION

1st version
1mm control-rod travel less than
full-load trav.mm: 13.90
Speed 1/min: 1190...1200

LOW IDLE

Speed 1/min: 300
Contr.-rod trav.mm: 6.50...6.70
Del.quantity cm3/: 32.0...38.0
1000H.: (29.0...41.0)

Dispersion cm3/: 6.00 1000H.: (10.00)

Pump runs in tandem

Full-load delivery not known. Set according to engine test report.

APPLICATION Ship

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                    START OF DELIVERY
                                                    Test pressure, bar: 25...27
Note inst. in remarks column
                                                                       : 5.20...5.30
                                                    Prestroke mm
Test sheet
                   : MB 14,7 E
                                                                       : (5.15...5.35)
                   : 09.03.87
                                                    Contr.-rod trav.mm: 20.00...21.00
Edition
                                                                      : 8- 7- 2- 6- 3- 5-
4- 1
                                                    Cam sequence
Superceeded
Calibrating oil
                  : ISO-4113
Combination no.
                   : 0 402 648 831
Injection pump
                                                    SD ang. spacing CS: 0-45-90-135-180-225-
Pump designation : PE8P120A320LS7801-1
                                                                         270-315
                                                    Tolerance + - 0
EP type number : 0 412 628 818
                                                                       : 0.50 (0.75)
Governor
Governor design. : RQV350..1050PA842-3
                                                    SD mark cyl. no. : 8
Governer no.
                : 0 421 813 622
                                                    BASIC SETTING
Customer-spec. information
                                                                   1/mi: 600
Customer
                   : DAIMLER-BENZ
                                                    1st speed
                                                    Contr.-rod trav.mm: 14.50...14.70
Engine
                   : 0M442 LA
1st version kW : 320.0
                                                    Del.quantity cm3/: 21.2...21.4
              1/min: 2100
Speed
                                                                  100H.: (20.9...21.7)
TEST BENCH REQUIREMENTS
                                                    Dispersion
                                                                 cm3/:0.5
Calibrating-oil inlet temp. OC
                  : 38...42
                                                                  100H.: (0.9)
                                                    2nd speed 1/min: 350
Contr.-rod trav. m: 5.70...5.90
Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.5)
Overflow valve
                   : 1 417 413 025
Inlet press., bar: 1.50
                                                                 cm3/:0.6
                                                    Dispersion
                                                                  100H.: (1.0)
Overflow
 quantity min. 1/h: 100...120
                                                    (B) Setting of injection pump with
Calibrating nozzle-holder
                                                        externally-mounted governor
 assembly : 1 688 901 019
                                                    SLEEVE TRAVELS
Opening
                                                    1st speed 1/min: 350
                   : 207...210
                                                      Sleeve travel mm: 1.90...2.10
 pressure, bar
                                                    2nd speed 1/min: 700
                                                      Sleeve travel mm: 4.00...4.40
Perforated-plate
                                                    3rd speed 1/min: 1100
                   : 0.8
 diameter mm
                                                      Sleeve travel mm: 6.80...7.20
                                                    4th speed 1/min: 1200
Sleeve travel mm: 8.30...8.70
Test inj. tubing
                  : 1 680 750 067
                                                    SLEEVE POSITION
Outside diameter
                                                    Control-lever position
x Wall thickness
                  : 6.00x1.50x1000
x Length mm
                                                                Degree: -1
                                                                 17min: 1150
                                                    Speed
(A) Injection pump setting values
                                                    Cont.-rod travelmm: 16.50...18.00
    Insp. values in parentheses
Set constant delivery quant.
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
    per values
                                                    1st version
C11
```

Speed 1/min: 600 Charge press. hPa: 750
Del.quantity cm3/: 212.0...214.0
1000H.: (209.0...217.0)
Dispersion cm3/: 5.00 1000H.: (9.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 58...66 Testing: 1st c-rod trav.mm : 14.20 1/min: 1090...1100 Speed 2nd c-rod trav.mm: 4.00 1/min : 1175...1205 Speed 1/min: 1300 4th speed C-rod trav.mm : 0.00...1.50 LOWEST RATED SPEED I Control-lever position degrees: 10...18 Testing: Speed 1/min : 100 C-rod trav.mm min : 7.40 1/min : 350 Speed : 5.70...5.90 C-rod trav.mm CONSTANT REGULATION 1/min : 350...550 Speed TORQUE CONTROL 2nd speed 1/min: 1050 C-rod trav.mm : 15.20...15.40 3rd speed 1/min: 975 C-rod trav.mm : 15.40...15.60 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 600 Speed hPa : 750 Pressure Contr.-rod trav.mm: 14.50...14.70 Measurement 1/min : 600 Speed 1st pressure hPa : 400 : 12.20...12.40 C-rod trav.mm : 550 2nd pressure hPa : 13.60...13.80 C-rod trav.mm : 900 3rd pressure hPa : 14.70...14.80 C-rod trav.mm 4th pressure hPa : 1250 : 15.50...15.70 C-rod trav.mm 5th pressure hPa : 150

SWITCH-OVER POINT 1/min : 270 (290) Speed FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 1250 Speed 1/min: 1050 Del.quantity cm3/: 227.0...230.0 1000H.: (224.0...233.0) cm3/:8.0Dispersion 1000H.: (12.0) Charge press. hPa : 1250 1/min : 900 Speed Del.quantity cm3/: 238.0...242.0 1000H.: (235.0...245.0) Dispersion cm3/: 8.0 1000H.: (12.0) Charge press. hPa : 1250 1/min : 1050 Speed Del.quantity cm3/: 156.0...159.0 1000H.: (153.0...162.0) Dispersion cm3/:8.01000H.: (12.0) Charge press. hPa : -Speed 1/min: 500 Del.quantity cm3/: 150.0...152.0 1000H.: (147.0...155.0) cm3/: 8.0 Dispersion 1000H.: (12.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 14.20 Speed 1/min : 1090...1100 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 240.3...260.0 1000H.: (236.0...264.0) Remarks:

C-rod trav.mm : 11.20...11.40

Note inst. in remarks column

Test sheet : MB 14,7 A 6 Edition : 15.05.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 648 833

Injection pump

Pump designation : PE8P120A320LS7801-1

EP type number : 0 412 628 818

Governor

Governor design. : RQV300..1050PA866 Governor no. : 0 421 813 628

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M442 A

1st version kW : 260.0 Speed 1/min: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Calibrating nozzle-holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_\_

```
START OF DELIVERY
                                                                       1/min: 1050
                                                        Charge press. hPa : 1100
Test pressure, bar: 25...27
                                                        Del.quantity cm3/: 181.0...183.0
1000H.: (178.0...186.0)
Dispersion cm3/: 5.00
1000H.: (9.00)
Prestroke mm
                    : 5.20...5.30
: (5.15...5.35)
Contr.-rod trav.mm: 20.00...21.00
Cam sequence : 8- 7- 2- 6- 3- 5-
                                                        HIGHEST RATED SPEED
                                                        1st version
                                                        Control-lever
                                                         position degrees: 59...67
SD ang. spacing CS: 0-45-90-135-180-225-
                       270-315
                                                        Testing:
Tolerance + - 0
                                                        1st c-rod trav.mm : 11.80
Speed 1/min : 1090...1100
2nd c-rod trav.mm : 4.00
                    : 0.50 (0.75)
SD mark cyl. no. : 8
                                                        Speed 1/min: 1160...1190
4th speed 1/min: 1300
BASIC SETTING
                                                           C-rod trav.mm : 0.00...1.50
1st speed 1/mi: 1050
                                                        LOWEST RATED SPEED I
Contr.-rod trav.mm: 12.80...12.90
                                                        Control-lever
                                                         position degrees: 10...18
Del.quantity cm3/: 18.1...18.3
                                                        Testing:
                                                        Speed 1/min: 200
C-rod trav.mm min: 7.30
               100H.: (17.8...18.6)
Dispersion
                                                        Speed 1/min: 350
               cm3/:0.5
                                                        C-rod trav.mm : 5.60...5.80
               100H.: (0.9)
                                                        CONSTANT REGULATION
2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.6...6.0

Del.quantity cm3/: 1.6...2.2

100H.: (1.3...2.5)

Dispersion cm3/: 0.6

100H.: (1.0)
                                                                      1/min : 300...500
                                                        Speed
                                                        TORQUE CONTROL
                                                        Torque-control curve - 1st version
                                                        1st speed 1/min: 1050
                                                          C-rod trav.mm : 12.80...12.90
                                                        2nd speed 1/min: 750
                                                          C-rod trav.mm : 14.40...14.60
(B) Setting of injection pump with
                                                        3rd speed 1/min: 950
    externally-mounted governor
                                                          C-rod trav.mm : 13.50...13.60
                                                        4th speed 1/min: 830
SLEEVE TRAVELS
                                                          C-rod trav.mm : 14.30...14.50
1st speed 1/min: 300
  Sleeve travel mm: 1.20...1.40
2nd speed 1/min: 600
                                                         compensator (LDA, ADA, ALDA)
Sleeve travel mm: 4.90...5.10
3rd speed 1/min: 1100
Sleeve travel mm: 8.00...8.50
                                                        1st version
                                                        Setting
4th speed 1/min: 1170
  Sleeve travel mm: 9.20...9.80
                                                                      1/min : 600
                                                        Speed
                                                        Pressure
                                                                      hPa : -
SLEEVE POSITION
                                                        Contr.-rod trav.mm: 11.20...11.50
Control-lever position
             Degree: -1
                                                        Measurement
              1/min: 1090
Speed
                                                        Speed
                                                                     1/min : 600
Cont.-rod travelmm: 16.50...18.00
                                                        1st pressure hPa : 420
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                         C-rod trav.mm : 11.90...12.10
                                                        2nd pressure hPa : 600
1st version
                                                          C-rod trav.mm : 13.60...13.80
C14
```

```
SWITCH-OVER POINT
Speed
             1/min : 220 (240)
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 1100
Speed 1/min : 700
             1/min : 700
Del.quantity cm3/: 213.0...217.0
1000H.: (210.0...220.0)
Dispersion
              cm3/: 8.00
             1000H.: (12.0)
Charge press. hPa : 1100
             1/min : 1050
Speed
Del.quantity cm3/: 152.0...154.0*
             1000H.: (149.G...157.0)
             cm3/: 8.00
1000H.: (12.0)
Dispersion
Charge press. hPa : -
Speed
             1/min : 500
Del.quantity cm3/: 143.0...145.0
1000H.: (140.0...148.0)
              cm3/:8.00
Dispersion
             1000H.: (12.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.80
             1/min : 1090...1100
Speed
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 180.0...200.0
             1000H.: (176.0...204.0)
Remarks:
* = Set at reduced-delivery stop.
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                    START OF DELIVERY
                                                    Test pressure, bar: 25...27
Note inst. in remarks column
                                                                        : 5.20...5.30
                                                    Prestroke mm
Test sheet
                                                                        : (5.15. 35.35)
                   : MB 14,7 A7
                                                    Contr.-rod trav.mm: 20.00...21.00
                   : 26.06.87
Edition
Superceeded
                                                                       : 8- 7- 2- 6- 3- 5-
                                                    Cam sequence
Calibrating oil : ISO-4113
                                                                            4- 1
Combination no.
                  : 0 402 648 834
                                                    SD ang. spacing CS: 0-45-90-135-180-225-
Injection pump
Pump designation : PE8P120A320LS7801-1
                                                                          270-315
                                                    Tolerance + - 0
                                                                       : 0.50 (0.75)
EP type number : 0 412 628 818
Governor
Governor design. : RQV350...900PA866-1
                                                    SD mark cyl. no. : 8
Governer no. : 0 421 813 629
                                                    BASIC SETTING
Customer-spec. information
                   : DAIMLER-BENZ
                                                                   1/mi: 880
Customer
                                                    1st speed
                   : 0M442 A
                                                    Contr.-rod trav.mm: 13.80...13.90
Engine
1st version kW : 267.0
                                                    Del.quantity cm3/: 20.3...20.5
             1/min: 1800
Speed
                                                                  100H.: (20.0...20.8)
TEST BENCH REQUIREMENTS
                                                                  cm3/:0.5
                                                    Dispersion
Calibrating-oil inlet temp. °C
                   : 38...42
                                                                  100H.: (0.9)
Overflow valve
                                                    2nd speed
                                                                  1/min: 350.0
                   : 1 417 413 025
                                                    Contr.-rod trav. m: 6.2...6.6
                                                    Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.5)
Dispersion cm3/: 0.6
Inlet press., bar: 1.50
                                                                  100H.: (1.0)
Over flow
 quantity min. 1/h: 100...120
                                                     (B) Setting of injection pump with
Calibrating nozzle-holder
                                                        externally-mounted governor
             : 1 688 901 019
 assembly
                                                    SLEEVE TRAVELS
                                                    1st speed 1/min: 300
Sleeve travel mm: 1.20...1.40
2nd speed 1/min: 425
Sleeve travel mm: 2.40...2.60
Opening
 pressure, bar
                   : 207...210
Perforated-plate
                                                    3rd speed 1/min: <u>550</u>
                   : 0.8
diameter mm
                                                      Sleeve travel mm: 3.30...3.70
                                                    4th speed 1/min: 900
                                                      Sleeve travel mm: 8.20...8.60
Test inj. tubing
                  : 1 680 750 067
                                                    5th speed 1/min: 975
                                                      Sleeve travel mm: 9.70...10.30
Outside diameter
x Wall thickness
                  : 6.00x1.50x1000
                                                    SLEEVE POSITION
x Length mm
                                                    Control-lever position
(A) Injection pump setting values
                                                                 Degree: -1
    Insp. values in parentheses
Set constant delivery quant.
                                                    Cont.-rod travelmm: 16.50...18.00
    per values
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
```

1st version 1/min: 880 Speed Charge press. hPa : 900 Del.quantity cm3/: 203.0...205.0 1000H.: (200.0...208.0) Dispersion cm3/: 5.00 1000H.: (9.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 116...124 Testing: 1st c-rod trav.mm : 12.80 1/min: 920...930 Speed 2nd c-rod trav.mm : 4.00 1/min: 990...1020 Speed 1/min: 1300 4th speed : 0.00...1.50 C-rod trav.mm LOWEST RATED SPEED I Control-lever position degrees: 64...72 Testing: 1/min : 100 Speed C-rod trav.mm min : 7.90 1/min : 350 Speed : 6.20...6.40 C-rod trav.mm CONSTANT REGULATION 1/min: 300...500 Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 880 1st speed C-rod tray.mm : 13.80...13.90 1/min : 750 2nd speed C-rod trav.mm : 14.40...14.60 3rd speed 1/min: 825 C-rod trav.mm : 14.00...14.20 compensator (LDA,ADA,ALDA) 1st version Setting Speed 1/min : 600 Pressure h2a Contr.-rod trav.mm: -Measurement 1/min : 600 Speed 1st pressure hPa : 350 C-rod trav.mm : 1.00...1.20 2nd pressure hPa : 550 C-rod tray.mm : 2.60...2.80

SWITCH-OVER POINT

1/min : 270 (290) Speed

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 900 1/min: 700 Speed

Del.quantity cm3/: 212.0...216.0 1000H.: (209.0...219.0)

Dispersion

cm3/: 8.0 1000H.: (12.0)

Charge press. hPa : -1/min : 500 beeal

Del.quantity cm3/: 143.0...145.0

1000H.: (140.0...148.0)

cm3/:8.0Dispersion 1000H.: (12.0)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 12.80 Speed 1/min : 920...930

STARTING FUEL DELIVERY

1/min : 100

Del.quantity cm3/: 180.0...200.0

1000H.: (176.0...204.0)

Remarks:

Note inst. in remarks column

Test sheet Edition Superceeded : MB 14,7 A8 : 21.08.87

Calibrating oil : ISO-4113

Combination no. : 0 402 648 841

Injection pump

Pump designation : PE8P12OA32OLS7801-1

EP type number : 0 412 628 818

Governor

Governor design. : RQ300/1050PA762-5 Governer no. : 0 421 801 399

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M442 A Engine

1st version kW : 260.0 1/min: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Over flow

quantity min. 1/h: 100...120

Calibrating nozzie-holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Perforated-plate

: 0.8 diameter mm

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

```
START OF DELIVERY
Test pressure, bar: 25...27
                                                         1st version
                                                                        1/min: 600
                                                         Speed
                                                         Charge press. hPa: 650
Del.quantity cm3/: 196.0...198.0
1000H.: (193.0...201.0)
Prestroke mm
                     : 5.20...5.30
                     : (5.15...5.35)
Contr.-rod trav.mm: 20.00...21.00
                                                         Dispersion cm3/ : 5.00
                     : 8- 7- 2- 6- 3-
Cam sequence
                          4- 1
                                                                       1000Ha: (9.00)
                                                         HIGHEST RATED SPEED
                                                         1st version
SD ang. spacing CS: 0-45-90-135-180-225-
270-315
                                                         Control-lever
                                                          position degrees: 32...40
Tolerance + - 0
                     : 0.50 (0.75)
                                                         Setting point:
SD mark cyl. no. : 8
                                                         Speed
                                                                     1/min : 600
                                                         Contr.-rod trav.mm: 20.0
BASIC SETTING
                                                         Testing:
1st speed 1/mi: 600
                                                         1st c-rod trav.mm : 11.80
                                                         Speed 1/min: 1095...1110
2nd c-rod trav.mm: 4.00
Contr.-rod trav.mm: 13,80...14.00
                                                         Speed 1/min: 1170...1200
4th speed 1/min: 1300
Del.quantity cm3/ : 19.6...19.8
                                                           C-rod trav.mm : 0.00...1.50
               100H.: (19.3...20.1)
                                                         LOWEST RATED SPEED I
Dispersion
               cm3/:0.5
                                                         Control-lever
                                                          position degrees: 10...18
               100H.: (0.9)
                                                         Setting point w/out aux. spring
                                                                      1/min : 300
2nd speed
               1/min: 300.0
                                                         Contr.-rod trav.mm: 6.3
Contr.-rod trav. m: 6.2...6.6

Del.quantity cm3/: 1.6...2.2

100H.: (1.3...2.5)

Dispersion cm3/: 0.6

100H.: (1.0)
                                                         Testing:
                                                                       1/min : 200
                                                         Speed
                                                         C-rod trav.mm min : 8.00
                                                                      1/min : 300
                                                         Speed
                                                         C-rod trav.mm : 6.30
C-rod trav.mm : 2.00
(B) Setting of injection pump with externally-mounted governor
                                                                      1/min : 380...420
                                                         Speed
SLEEVE TRAVELS
                                                         TORQUE CONTROL
1st speed 1/min: 300
Sleeve travel mm: 2.20...2.40
2nd speed 1/min: 600
                                                         Dimension a mm : 0.75
                                                         2nd speed 1/min : 1050
                                                           C-rod trav.mm : 12.80...13.00
Sleeve travel mm: 5.90...6.10
3rd speed 1/min: 870
                                                         3rd speed 1/min: 850
                                                           C-rod trav.mm : 13.90...14.10
                                                         4th speed 1/min: 700
  Sleeve travel mm: 6.10...6.30
4th speed 1/min: 1050
                                                                              : 14.20...14.50
                                                           C-rod trav.mm
Sleeve travel mm: 6.70...6.90
Sth speed 1/min: 1170
Sleeve travel mm: 9.20...9.80
                                                          compensator (LDA,ADA,ALDA)
SLEEVE POSITION
                                                         1st version
Control-lever position
                                                         Setting
              Degree: 108...110
                                                                       1/min : 600
                                                         Speed
               17min: 600
Speed
                                                         Pressure
                                                                       hPa : 650
Cont.-rod travelmm: 19.20...20.80
                                                         Contr.-rod trav.mm: 13.80...14.00
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                         Measurement
C19
```

```
Speed
             1/min : 600
1st pressure hPa : 300
  C-rod trav.mm
                   : 12.10...12.30
2nd pressure hPa
                  : 400
  C-rod trav.mm
                   : 13.10...13.40
                  : 850
3rd pressure hPa
                   : 13.90...14.00
  C-rod trav.mm
SWITCH-OVER POINT
Speed
             1/min : 220 (240)
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 1050
Speed
             1/min : 1050
Del.quantity cm3/: 178.0...181.0
1000H.: (175.0...184.0)
              cm3/:8.0
Dispersion
             1000H.: (12.0)
Charge press. hPa : 1050
Speed
             1/min : 700
Del.quantity cm3/: 209.0...213.0
            1000H.: (206.0...216.0)
cm3/: 8.0
1000H.: (12.0)
Dispersion
Charge press. hPa : 1050
             1/min: 850
Speed
Del.quantity cm3/: 206.0...210.0
             1000H.: (203.0...213.0)
Dispersion
              cm3/:8.0
             1000H.: (12.0)
Charge press. hPa : -
             1/min : 500
Speed
Del.quantity cm3/: 145.0...147.0
             1000H.: (142.0...150.0)
              cm3/:8.0
Dispersion
             1000H.: (12.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.80
Speed
            1/min : 1095...1110
STARTING FUEL DELIVERY
            1/min : 100
Speed
Del.quantity cm3/: 175.0...190.0
            1000H.: (171.0...194.0)
Remarks:
```

Note inst. in remarks column

Test sheet : MB 18,3 L : 09.03.87 Edition Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 649 800

Injection pump

Pump designation : PE10P120A320LS7809

EP type number : 0 412 629 800

Governor

Governor design. : RQ300/1050PA856 Governer no. : 0 421 801 386

Customer-spec. information

: DAIMLER-BENZ Customer

Engine : 0M443 LA

1st version kW : 401.0 Speed 1/min: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Over flow

quantity min. 1/h: 130...150

Calibrating nozzle-holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

```
START OF DELIVERY
                                                     Speed 1/min: 600
Test pressure, bar: 25...27
                                                     Contr.-rod trav.mm: 20.0
Prestroke mm
                    : 4.00...4.10
                                                     Testing:
                    : (3.95...4.15)
                                                     1st c-rod trav.mm: 14.10
Contr.-rod trav.mm: 20.00...21.00
                                                       Speed 1/min: 1095...1110
                   : 10- 9- 4- 1-
- 6- 3- 5-
                                                     2nd c-rod trav.mm : 4.00
Cam sequence
                                                       Speed 1/min: 1150...1180
                                                                  1/min : 1300
                                                     4th speed
                                                       C-rod tray.mm : 0.00...1.50
SD ang. spacing CS: 0-45-72-117-144-189-
                                                     LOWEST RATED SPEED I
                   216-261-288-333
: 0.50 (0.75)
                                                     Control-lever
Tolerance + - 0
                                                      position degrees: 9...17
                                                     Setting point w/out aux. spring
SD mark cyl. no. : 10
                                                                 1/min : 300
                                                     Contr.-rod trav.mm: 6.7
BASIC SETTING
                                                     Testing:
1st speed 1/mi: 600
                                                     Speed
                                                                  1/min : 100
                                                     C-rod trav.mm min: 8.30
Contr.-rod trav.mm: 14.70...14.90
                                                                 1/min : 300
                                                     Speed
                                                     C-rod trav.mm : 6.70
C-rod trav.mm : 2.00
Del.quantity cm3/: 21.9...22.1
                                                                 1/min: 380...420
                                                     Speed
              100H.: (21.6...22.4)
                                                     TORQUE CONTROL
Dispersion
                                                     2nd speed 1/min : 1050
              cm3/:0.5
                                                     C-rod trav.mm : 15.10...15.30
3rd speed 1/min : 800
              100H.: (0.9)
                                                       C-rod trav.mm : 15.50...15.70
            1/min: 300.0
2nd speed
Contr.-rod trav. m: 6.6...6.8
Del.quantity cm3/: 1.6...2.2
                                                      compensator (LDA,ADA,ALDA)
              100H.: (1.3...2.5)
              cm3/:0.6
Dispersion
                                                     1st version
              100H.: (1.0)
                                                     Setting
                                                                  1/min : 600
                                                     Speed
SLEEVE POSITION
                                                     Pressure
                                                                 hPa : 900
Control-lever position
                                                     Contr.-rod trav.mm: 14.70...14.90
             Degree: 108...110
Speed
              17min: 600
                                                     Measurement
                                                                 1/min : 600
Cont.-rod travelmm: 19.20...20.80
                                                     Speed
                                                     1st pressure hPa : 400
C-rod trav.mm : 12.10...12.30
2nd pressure hPa : 600
FULL-LOAD DELIV. AT FULL-LOAD STOP
1st version
                                                     C-rod trav.mm : 13.60...13.80
3rd pressure hPa : 960
Speed
              1/min: 600
Charge press. hPa : 900
Del.quantity cm3/: 219.0...221.0
1000H.: (216.0...224.0)
Dispersion cm3/: 5.00
1000H.: (9.00)
                                                       C-rod trav.mm : 14.80...14.90
                                                     4th pressure hPa : 1100
                                                       C-rod trav.mm : 15.20...15.40
                                                     SWITCH-OVER POINT
HIGHEST RATED SPEED
1st version
                                                     Speed
                                                               1/min : 220 (240)
Control-lever
 position degrees: 36...44
                                                    FUEL-DELIVERY CHARACTERISTICS
Setting point:
```

```
1st version
Charge press. hPa : 1300
Speed 1/min: 1050
Del.quantity cm3/: 229.0...232.0
1000H.: (226.0...235.0)
                  cm3/:8.0
Dispersion
                 1000H.: (12.0)
Charge press. hPa : 1300
                 1/min : 800
Speed
Del.quantity cm3/: 234.0...238.0
1000H:: (231.0...241.0)
                cm3/: 8.0
1000H:: (12.0)
Dispersion
Charge press. hPa : -
Speed 1/min : 5
Speed 1/min: 500
Del.quantity cm3/: 133.0...135.0
1000H:: (130.0...138.0)
Dispersion cm3/: 8.0
                 1000H.: (-)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 14.10
Speed
                1/min : 1095...1110
STARTING FUEL DELIVERY
                1/min : 100
Speed
Del.quantity cm3/: 230.0...250.0
1000H.: (226.0...254.0)
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : MB 18.3 L1 Edition : 27.03.87 Superceeded Calibrating oil : ISO-4113 Combination no. : 0 402 649 801 Injection pump Pump designation : PE10P120A320LS7809-1 EP type number : 0 412 629 801 Governor Governor design. : RQ300/1050PA717-1 Governer no. : 0 421 801 396 Customer-spec. information Customer : DAIMLER-BENZ : 0M443 LA Engine 1st version kW : 401.0 Speed 1/min: 2100 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar : 1.50 Over flow quantity min. 1/h: 130...150 Calibrating nozzle-holder assembly : 1 688 901 019 Opening pressure, bar : 207...210 Perforated-plate diameter mm : 0.8 Test inj. tubing : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_\_

```
START OF DELIVERY
Test pressure, bar: 25...27
                                                       1st version
                                                                      1/min: 600
                                                       Speed
                                                       Charge press. hPa: 900
                     : 4.00...4.10
Prestroke mm
                     (3.95...4.15)
                                                       Del.quantity cm3/: 219.0...221.0
1000H.: (216.0...224.0)
Dispersion cm3/: 5.00
1000H.: (9.00)
Contr.-rod trav.mm: 20.00...21.00
Cam sequence : 10- 9- 4- 1- 8- 7
- 6- 3- 5- 2
                                                       HIGHEST RATED SPEED
                                                       1st version
SD ang. spacing CS: 0-45-72-117-144-189-
                                                       Control-lever
                     216-261-288-333
                                                        position degrees: 36...44
Tolerance + - 0 : 0.50 (0.75)
                                                       Setting point:
SD mark cyl. no. : 10
                                                       Speed 1/min: 600
                                                       Contr.-rod trav.mm: 20.0
BASIC SETTING
                                                       Testing:
                                                       1st c-rod trav.mm : 14.10
Speed 1/min : 1095...1110
2nd c-rod trav.mm : 4.00
1st speed 1/mi: 600
Contr.-rod trav.mm: 14.70...14.90
                                                       Speed 1/min: 1150...1180
4th speed 1/min: 1300
Del.quantity cm3/: 21.9...22.1
                                                         C-rod trav.mm : 0.00...1.50
               100H.: (21.6...22.4)
                                                       LOWEST RATED SPEED I
               cm3/:0.5
Dispersion
                                                       Control-lever
                                                        position degrees: 9...17
               100H.: (0.9)
                                                       Setting point w/out aux. spring
                                                                    1/min : 300
               1/min: 300.0
                                                       Contr.-rod trav.mm: 6.7
2nd speed
Contr.-rod trav. m: 6.6...6.8
Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.5)
Dispersion cm3/: 0.6
100H.: (1.0)
                                                       Testing:
                                                       Speed `
                                                                     1/min : 100
                                                       C-rod trav.mm min: 8.30
                                                                    1/min : 300
                                                       Speed
                                                       C-rod trav.mm : 6.70
C-rod trav.mm : 2.00
(B) Setting of injection pump with
                                                                    1/min : 380...420
    externally-mounted governor
                                                       Speed
                                                       TORQUE CONTROL
SLEEVE TRAVELS
1st speed 1/min: 300
Sleeve travel mm: 2.80...3.00
2nd speed 1/min: 600
                                                       2nd speed 1/min: 1050
                                                       G-rod trav.mm : 15.10...15.30
3rd speed 1/min : 800
Sleeve travel mm: 6.00...6.20
3rd speed 1/min: 900
                                                         C-rod trav.mm : 15.50...15.70
  Sleeve travel mm: 6.10...6.30
                                                        compensator (LDA,ADA,ALDA)
4th speed 1/min: 1000
  Sleeve travel mm: 6.30...6.40
5th speed 1/min: 1150
Sleeve travel mm: 9.30...9.70
                                                       1st version
                                                       Setting
                                                                     1/min : 600
                                                       Speed
SLEEVE POSITION
                                                       Pressure
                                                                    hPa : 900
Control-lever position
                                                       Contr.-rod trav.mm: 14.70...14.90
             Degree: 108...110
Speed
              17min: 600
                                                       Measurement
Cont.-rod travelmm: 19.20...20.80
                                                       Speed
                                                                     1/min : 600
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                       1st pressure hPa : 400
```

C25

```
C-rod trav.mm
                   : 12.10...12.30
2nd pressure hPa
                   : 600
  C-rod trav.mm
                   : 13.60...13.80
3rd pressure hPa
                   : 960
                   : 14.80...14.90
  C-rod trav.mm
                   : 1100
4th pressure hPa
  C-rod trav.mm
                   : 15.20...15.40
SWITCH-OVER POINT
Speed
            1/min : 220 (240)
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 1300
            1/min : 1050
Speed
Del.quantity cm3/ : 229.0...232.0
            1000H.: (226.0...235.0)
Dispersion
             cm3/:8.0
            1000H.: (12.0)
Charge press. hPa : 1300
Speed 1/min : 800
            1/min : 800
Del.quantity cm3/: 234.0...238.0
            1000H.: (231.0...241.0)
             cm3/:8.0
Dispersion
            1000H.: (12.0)
Charge press. hPa : -
            1/min : 500
Speed
Del.quantity cm3/: 133.0...135.0
            1000H.: (130.0...138.0)
             cm3/:8.0
Dispersion
            1000H.: (~)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm; 14.10
Speed
            1/min : 1095...1110
STARTING FUEL DELIVERY
            1/min : 100
Speed
Del.quantity cm3/ : 230.0...250.0
            1000H.: (226.0...254.0)
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet Edition Superceeded : MB 18,3 M : 14.08.87 Calibrating oil : ISO-4113 Combination no. : 0 402 649 803 Injection pump Pump designation : PE10P120A320LS7809-1 EP type number : 0 412 629 801 Governor Governor design.: RQV300..1050PA797-4 Governer no. : 0 421 813 654 Customer-spec. information Customer : DAIMLER-BENZ Engine : 0M443 LA 1st version kW : 401.0 Speed 1/min: €100 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar : 1.50 Overflow quantity min. 1/h: 130...150 Calibrating nozzle-holder : 1 688 901 019 assembly Opening pressure, bar : 207...210 Perforated-plate diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_\_

START OF DELIVERY Test pressure, bar: 2527	1st version Speed 1/min: 600 Charge press. hPa : 900
Prestroke mm : 4.004.10 : (3.954.15)	Del.quantity cm3/: 219.0221.0 1000H.: (216.0224.0)
Contrrod trav.mm: 20.0021.00 Cam sequence : 10-9-4-1-8-7-6-3-5-2	Dispersion cm3/: 5.00 1000H.: (9.00)
	HIGHEST RATED SPEED 1st version
SD ang. spacing $^{0}$ CS: $0-45-72-117-144-189-1216-261-288-333$   Tolerance $+-^{0}$ : $0.50$ ( $0.75$ )	Control-lever position degrees: 3644
SD mark cyt. no. : 10	Testing: 1st c-rod trav.mm : 14.10
BASIC SETTING	Speed 1/min: 10901100 2nd c-rod trav.mm: 4.00
1st speed 1/mi: 600	Speed 1/min: 11551185 4th speed 1/min: 1300 C-rod trav.mm: 0.001.00
Contrrod trav.mm: 14.7014.90	LOWEST RATED SPEED I
Del.quantity cm3/: 21.922.1	Control-lever position degrees: 917
100H.: (21.622.4)	Testing:
Dispersion cm3/: 0.5	Speed 1/min: 200 C-rod trav.m. min: 8.60
100H.: (0.9)	Speed 1/min : 300 C-rod trav.mm : 6.606.80
2nd speed 1/min: 300.0 I Contrrod trav. m: 6.66.8 I	CONSTANT REGULATION
Del.quantity cm3/: 1.62.2   1   100H.: (1.32.5)	Speed 1/min: 300400
Dispersion cm3/: 0.6 1 100H.: (1.0)	TORQUE CONTROL  2nd speed  1/min : 1050 C-rod trav.mm : 15.1015.30
(B) Setting of injection pump with externally-mounted governor	3rd speed 1/min: 800 C-rod trav.mm: 15.5015.70
SLEEVE TRAVELS 1st speed 1/min: 300	compensator (LDA,ADA,ALDA)
Sleeve travel mm: 1.201.40	1st version Setting Speed 1/min: 600 Pressure hPa: 900 Contrrod trav.mm: 14.7014.90
5th speed 1/min: 1150	Measurement Speed 1/min : 600
SLEEVE POSITION Control-lever position Degree: -1 Speed 1/min: 1100 Controd travelmm: 15.2017.80	1st pressure hPa : 400 C-rod trav.mm : 12.1012.30 2nd pressure hPa : 600 C-rod trav.mm : 13.6013.80 3rd pressure hPa : 960 C-rod trav.mm : 14.8014.90
FULL-LOAD DELIV. AT FULL-LOAD STOP	4th pressure hPa : 1100 C-rod trav.mm : 15.2015.40
C28	

```
SWITCH-OVER POINT
Speed
              1/min : 220 (240)
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 1300
Speed 1/min : 1050
Del.quantity cm3/ : 229.0...232.0
              1000H.: (226.0...235.0)
               cm3/:8.0
Dispersion
              1000H.: (12.0)
Charge press. hPa: 1300
              1/min : 800
Speed
Del.quantity cm3/: 234.0...238.0
1000H.: (231.0...241.0)
              cm3/: 8.0
1000H.: (12.0)
Dispersion
Charge press. hPa : -
Speed
              1/min : 500
Del.quantity cm3/: 133.0...135.0
1000H.: (130.0...138.0)
               cm3/ : 8.0
Dispersion
              1000H.: (-)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 14.10
Speed
              1/min : 1090...1100
STARTING FUEL DELIVERY
Speed
              1/min : 100
Del.quantity cm3/: 230.0...250.0
              1000H.: (226.0...254.0)
Remarks:
```

Note inst. in remarks column

Test sheet Edition : MB 21,9 Z : 09.03.87 Superceeded

Calibrating oil : ISO-4113

: 0 402 670 800 Combination no.

Injection pump

Pump designation : PE12P12OA32OL\$7805-1 EP type number : 0 412 620 804

Governor

Governor design. : RSV350...750P0A825 Governor no. : 0 421 833 221

Customer-spec. information Customer : DAIMLER-BENZ

: OM 444 LA Engine

1st version kW : 389.0 1/min: 1500 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Overflow

quantity min. 1/h: 150...170

Calibrating nozzle-holder

assembly : 1 688 901 019

Opening -

pressure, bar : 207...215

Perforated-plate

: 0.8 diameter mm

Test inj. tubing : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

```
START OF DELIVERY
Test pressure, bar: 25...27
                   : 5.20...5.30
Prestroke mm
                   : (5.15...5.35)
Contr.-rod trav.mm: 9.00...12.00
                   : 12-1-5-9-8-3-4-11-10
Cam sequence
                     -2-6-7
SD ang. spacing<sup>o</sup>CS: 0-45-60-105-120-165-
                     180-225-240-285-300-
                     345
Tolerance + - 0
                   : 0.50 (0.75)
SD mark cyl. no. : 12
BASIC SETTING
1st speed 1/mi: 700
Contr.-rod trav.mm: 14.10...14.20
Del.quantity cm3/: 21.0...21.2
              100H.: (20.7...21.5)
Dispersion
              cm3/:0.5
              100H.: (0.9)
2nd speed
              1/min: 350
Contr.-rod trav. m: 5.40...5.60
Del.quantity cm3/: 1.4...2.0
             100H.: (1.1...2.3)
cm3/: 0.8
100H.: (1.2)
Dispersion
SLEEVE POSITION
Control-lever position
            Degree: -3
              1/min: 800
Speed
Cont.-rod travelmm: 0.30...1.40
FULL-LOAD DELIV. AT FULL-LOAD STOP
1st version
              1/min: 700
Speed
Del.quantity cm3/: 210.0...212.0
            1000H.: (207.0...215.0)
cm3/ : 5.00
Dispersion
             1000H.: (9.00)
HIGHEST RATED SPEED
1st version
Control-lever
 position degrees: 21...29
Testing:
003
```

1st c-rod trav.mm : 13.10 Speed 1/min: 750...755 2nd c-rod trav.mm: 4.00 Speed 1/min: 780...790 4th speed 1/min: 1900 C-rod trav.mm : 0.30...1.70 LOWEST RATED SPEED I Control-lever position degrees: 9...17
Setting point w/out aux. spring
Speed 1/min: 350 Contr.-rod trav.mm: 5.5 Testing: 1/min : 100 Speed ` C-Fod trav.mm min : 19.50 1/min : 350 Speed C-rod trav.mm SET IDLE AUXILIARY SPRING Contr.-rod trav.mm: 2.00 FUEL-DELIVERY CHARACTERISTICS 1/min : 650 Speed Del.quantity cm3/: 207.0...213.0 1000H.: (204.0...216.0) cm3/:8.0Dispersion 1000H.: (12.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 13.10 1/min : 750...755 Speed

STARTING FUEL DELIVERY

1/min : 100 Speed Del.quantity cm3/: 210.0...230.0 1000H.: (206.0...234.0)

Remarks: Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                  START OF DELIVERY
                                                  Test pressure, bar: 25...27
Note inst. in remarks column
                                                                     : 5.20...5.30
                                                  Prestroke mm
                  : MB 21,9 Y
: 09.03.87
                                                                     : (5.15...5.35)
Test sheet
                                                  Contr.-rod trav.mm: 9.00...12.00
Edition
Superceeded
                 : 12.86
                                                                     : 12-1-5-9-8-3-4-11-10
                                                  Cam sequence
Calibrating oil : ISO-4113
                                                                       -2-6-7
Combination no.
                  : 0 402 670 801
                                                  SD ang. spacing CS: 0-45-60-105-120-165-
Injection pump
                   : PE12P12OA320LS7807
                                                                       180-225-240-285-300-
Pump designation
EP type number
                                                                       345
                   : 0 412 620 806
                                                  Tolerance + - 0
                                                                     : 0.50 (0.75)
Governor
                   : RSV350...750P0A825-1
Governor design.
                  : 0 421 833 248
Governer no.
                                                  SD mark cyl. no. : 12
Customer-spec. informatton
                                                  BASIC SETTING
Customer
                  : DAIMLER-BENZ
                                                  1st speed
                                                                1/mi: 700
Engine |
                   : OM 444 LA
                                                  Contr.-rod trav.mm: 15.80...15.90
1st version kW : 407.0
             1/min: 1500
                                                  Del.quantity cm3/: 24.1...24.3
Speed
TEST BENCH REQUIREMENTS
                                                                100H.: (23.8...24.6)
Calibrating-oil inlet temp. OC
                                                                cm3/:0.5
                                                  Dispersion
                  : 38...42
                                                                100H.: (0.9)
Overflow valve
                   : 1 417 413 025
                                                                1/min: 350
                                                  2nd speed
                                                  Contr.-rod trav. m: 5.40...5.60
                                                  Del.quantity cm3/: 1.4...2.0
Inlet press., bar : 1.50
                                                                100H.: (1.1...2.3)
                                                                cm3/: 0.8
100H.: (1.2)
Overflow
                                                  Dispersion
 quantity min. 1/h: 150...170
Calibrating nozzle-holder
                                                  SLEEVE POSITION
                  : 1 688 901 019
 assembly
                                                  Control-lever position
                                                               Degree: -3
                                                                17min: 800
Opening
                                                  Speed
                                                  Cont.-rod travelmm: 0.30...1.40
 pressure, bar : 207...210
                                                  FULL-LOAD DELIV. AT FULL-LOAD STOP
Perforated-plate
 diameter mm
                   : 0.8
                                                  1st version
                                                                1/min: 700
                                                  Speed
                                                  Del.quantity cm3/: 241.0...243.0
Test inj. tubing : 1 680 750 067
                                                              1000H.: (238.0...246.0) cm3/: 5.00
Outside diameter
                                                  Dispersion
x Wall thickness
                                                               1000H.: (9.00)
                 : 6.00x1.50x1000
x Length mm
                                                  HIGHEST RATED SPEED
(A) Injection pump setting values
                                                  1st version
    Inso, values in parentheses
                                                  Control-lever
    Set constant delivery quant.
                                                   position degrees: 23...31
    per values
                                                  Testing:
004
```

```
1st c-rod trav.mm : 14.80
Speed 1/min : 750...755
2nd c-rod trav.mm : 4.00
Speed 1/min : 780...790
4th speed 1/min : 1000
C-rod trav.mm : 0.30...1.70
LOWEST RATED SPEED I
Control-lever
 position degrees: 9...17
Setting point w/out aux. spring
Speed 1/min: 350
Contr.-rod trav.mm: 5.5
Testing:
Speed
               1/min : 100
C-rod trav.mm min : 19.50
          1/min : 350
av.mm : 5.50
Speed
C-rod trav.mm
SET IDLE AUXILIARY SPRING
Contr.-rod trav.mm: 2.00
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
full-load trav.mm: 14.80
Speed 1/min: 750...755
STARTING FUEL DELIVERY
Speed
               1/min : 100
Del.quantity cm3/: 240.0...260.0
1000H.: (236.0...264.0)
Remarks:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     START OF DELIVERY
                                                     Test pressure, bar: 25...27
Note inst. in remarks column
                                                                         : 5.20...5.30
                                                     Prestroke mm
                   : MB 21,9 Y1
                                                                         : (5.15...5.35)
Test sheet
                   : 21.08.87
                                                     Contr.-rod trav.mm: 9.00...12.00
Edition
Superceeded
                                                                         : 12-1-5-9-8-3-4-11-10
                                                     Cam sequence
                   : ISO-4113
                                                                           -2-6-7
Calibrating oil
                   : 0 402 670 802
Combination no.
                                                     SD ang. spacing CS: 0-45-60-105-120-165-
Injection pump
Pump designation : PE12P12OA32OLS7807
                                                                           180-225-240-285-300-
EP type number
                   : 0 412 620 806
                                                     Tolerance + - 0
                                                                         : 0.50 (0.75)
Governor
Governor design. : RSV350...750P0A825-2
Governer no.
                   : 0 421 833 250
                                                     SD mark cyl. no. : 12
                                                     BASIC SETTING
Customer-spec. information
Customer
                   : DAIMLER-BENZ
                                                                1/mi: 700
                                                     1st speed
                   : OM 444 A
Engine
                                                     Contr.-rod trav.mm: 14.10...14.20
1st version kW
                  : 360.0
                                                     Del.quantity cm3/: 21.5...21.7
Speed
              1/min: 1500
TEST BENCH REQUIREMENTS
                                                                   100H.: (21.2...22.0)
Calibrating-oil inlet temp. OC
                                                     Dispersion
                                                                   cm3/:0.5
                   : 38...42
                                                                   100H.: (0.9)
Overflow valve
                   : 1 417 413 025
                                                     2nd speed
                                                                   1/min: 350.0
                                                     Contr.-rod trav. m: 4.8...5.0

Del.quantity cm3/: 1.4...2.0

100H.: (1.1...2.3)

Dispersion cm3/: 0.8
Inlet press., bar : 1.50
Overflow
                                                                   100H.: (1.2)
 quantity min. 1/h: 150...170
Calibrating nozzle-holder
                                                     SLEEVE POSITION
                   : 1 688 901 019
                                                     Control-lever position
 assembly
                                                                  Degree: -3
1/min: 800
Opening
                                                     Speed
                   : 207...210
                                                     Cont.-rod travelmm: 0.30...1.40
 pressure, bar
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Perforated-plate
 diameter mm
                   : 0.8
                                                     1st version
                                                                   1/min: 700
                                                     Speed
                                                     Del.quantity cm3/: 215.0...217.0
1000H.: (212.0...220.0)
Dispersion cm3/: 5.00
Test inj. tubing
                  : 1 680 750 067
Outside diameter
                                                                  1000H.: (9.00)
x Wall thickness
                   : 6.00x1.50x1000
x Length mm
                                                     HIGHEST RATED SPEED
(A) Injection pump setting values
                                                     1st version
                                                     Control-lever
    Insp. values in parentheses
    Set constant delivery quant.
                                                      position degrees: 23...31
    per values
                                                     Testing:
```

```
1st c-rod trav.mm : 13.10
            1/min: 750...755
  Speed
2nd c-rod trav.mm: 4.00
  Speed
            1/min : 780...790
           1/min : 1000
4th speed
                  : 0.30...1.70
  C-rod trav.mm
LOWEST RATED SPEED I
Control-lever
 position degrees: 9...17
Setting point W/out aux. spring
Speed 1/min: 350
Contr.-rod trav.mm: 4.9
Testing:
Speed
             1/min : 100
C-rod trav.mm min : 19.50
            1/min : 350
Speed
C-rod trav.mm
                    : 4.90
SET IDLE AUXILIARY SPRING
Contr.-rod trav.mm: 2.00
FUEL-DELIVERY CHARACTERISTICS
             1/min : 600
Speed
Del.quantity cm3/: 218.0...224.0
1000H.: (215.0...227.0)
             cm3/: 8.0
1000H.: (12.0)
Dispersion
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 13.10
             1/min : 750...755
Speed
STARTING FUEL DELIVERY
Speed
             1/min : 100
Del.quantity cm3/: 220.0...240.0
1000H.: (216.0...244.0)
LOW IDLE
             1/min : 350
Speed
Contr.-rod trav.mm: 4.80...5.00
Del.quantity cm3/: 14.0...20.0
             1000H.: (11.0...23.0)
             cm3/: 8.00
1000H:: (12.00)
Dispersion
Remarks:
Observe VDT-I-420/120
0
```

007

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                       : 5.20...5.30
                                                    Prestroke mm
                                                                        : (5.15...5.35)
                                                    Contr.-rod trav.mm: 19.00...21.00
Cam sequence : 12-1-5-9-8-3-4-11-10
Note inst. in remarks column
                                                                         -2-6-7
                   : MB 21.9 J1
: 21.08.87
Test sheet
Edition
Superceeded
Calibrating oil
                   : ISO-4113
                                                    SD ang. spacing CS: 0-45-60-105-120-165-
                                                                         180-225-240-285-300-
Combination no.
                   : 0 402 670 804
                                                    SD ang. spacing CS: 345
Tolerance + - : 0.50
Injection pump
                                                                     : 0.50 (0.75)
Pump designation : PE12P12DA32OLS7813-1
EP type number : 0 412 620 811
                                                    SD mark cyl. no. : 12
Governor
Governor design. : RSV350...750P0A825-5
                                                    BASIC SETTING
Governer no.
                   : 0 421 833 277
                                                                   1/mi: 700
                                                    1st speed
Customer-spec. information
Customer
                   : DAIMLER-BENZ
                                                    Contr.-rod trav.mm: 15.00...15.10
Engine
                   : OM 441 A
                                                    Del.quantity cm3/: 26.7...26.9
TEST BENCH REQUIREMENTS
                                                                  100H.: (26.4...27.2)
Calibrating-oil inlet temp. OC
                                                                  cm3/:0.5
                                                    Dispersion
                   : 38...42
                                                                  100H.: (0.9)
Overflow valve
                   : 1 417 413 025
                                                                  1/min: 350.0
                                                    2nd speed
                                                    Contr.-rod trav. m: 4.8...5.0
Del.quantity cm3/: 1.4...2.0
Inlet press., bar : 1.50
                                                                  100H.: (1.1...2.3)
Overflow
                                                                  cm3/:0.8
                                                    Dispersion
                                                                  100H.: (1.2)
 quantity min. 1/h: 150...170
                                                    SLEEVE POSITION
Calibrating nozzle-holder
               : 1 688 901 019
 assembly
                                                    Control-lever position
                                                                 Degree: -3
                                                                  17min: 800
Opening
                                                    Speed
                   : 207...210
                                                    Cont.-rod travelmm: 0.30...1.40
 pressure, bar
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
Perforated-plate
 diameter mm
                   : 0.8
                                                    1st version
                                                    Speed 1/min: 700
Del.quantity cm3/: 267.0...269.0
Test inj. tubing : 1 680 750 067
                                                                 1000H.: (264.0...272.0)
                                                                 cm3/ : 5.00
Outside diameter
                                                    Dispersion
x Wall thickness
                                                                 1000H.: (9.00)
                   : 6.00x1.50x1000
x Length mm
                                                    HIGHEST RATED SPEED
(A) Injection pump setting values
                                                    1st version
    Insp. values in parentheses
                                                    Control-lever
    Set constant delivery quant.
                                                     position degrees: 23...31
    per values
                                                    Testing:
START OF DELIVERY
                                                    1st c-rod trav.mm : 14.00
                                                      Speed 1/min: 750...755
Test pressure, bar: 25...27
                                                    2nd c-rod trav.mm: 4.00
B00
```

```
1/min: 780...790
  Speed
4th speed 1/min: 1000
  C-rod trav.mm : 0.30...1.70
LOWEST RATED SPEED I
Control-lever
 position degrees: 9...17
Setting point w/out aux. spring
           1/min : 350
Contr.-rod trav.mm: 4.9
Testing:
            1/min : 100
Speed
C-rod trav.mm min : 19.50
Speed 1/min : 350
C-rod trav.mm
SET IDLE AUXILIARY SPRING
Contr.-rod trav.mm: 2.00
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 14.00
           1/min : 750...755
Speed
STARTING FUEL DELIVERY
Speed
            1/min : 100
Del.quantity cm3/: 240.0...260.0
1000H.: (236.0...264.0)
Remarks:
Observe VDT-I-420/120
0
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                         : 1-5-3-6-2-4
                                                      Cam sequence
Note inst. in remarks column
Test sheet
                                                      SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
                    : SCA 9,0 I
                    : 13.05.87
Edition
Superceeded
Calibrating oil
                   : ISO-4113
                                                      SD mark cyl. no. : 1
                    : 0 402 676 801
Combination no.
                                                      BASIC SETTING
Injection pump
                                                                     1/mi: 700
                                                      1st speed
Pump designation : PE6P12OA32OR$7102
EP type number
                    : 0 412 626 804
                                                      Contr.-rod trav.mm: 12.00...12.10
Governor
Governor design. : RSV350...1100P1A512
                                                      Del.quantity cm3/: 16.3...16.5
Governer no.
                   : 0 421 833 196
                                                                    100H.: (16.0...16.8)
Customer-spec. information
                    : SCANIA
Customer
                                                      Dispersion
                                                                    cm3/:0.6
Engine
                    : DS9 40,41
                                                                    100H.: (0.9)
TEST BENCH REQUIREMENTS
                                                                    1/min: 350.0
                                                      2nd speed
                                                      Contr.-rod trav. m: 4.4...4.6
Calibrating-oil inlet temp. °C
                                                     Del.quantity cm3/: 1.4...1.8
                                                                    100H.: (-)
cm3/: 0.3
100H.: (0.6)
                    : 38...42
                                                      Dispersion
Overflow valve
                    : 1 417 413 025
                                                      SLEEVE POSITION
Inlet press., bar : 1.50
                                                      Control-lever position
                                                                   Degree: -3
Calibrating nozzle-holder
                                                     Speed
                                                                    17min: 800
              : 1 688 901 019
                                                      Cont.-rod travelmm: 0.30...0.70
 assembly
                                                     Governor-spring reload
Opening
                   : 207...210
 pressure, bar
                                                     Notch setting x : 6.00
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Perforated-plate
                    : 0.8
 diameter mm
                                                      1st version
                                                                    1/min: 700
                                                     Speed
                                                     Del.quantity cm3/: 163.0...165.0
1000H:: (160.0...168.0)
Dispersion cm3/: 6.00
1000H:: (9.00)
                  : 1 680 750 015
Test inj. tubing
Outside diameter
x Wall thickness
                   : 6.00x1.50x600
x Length mm
                                                     HIGHEST RATED SPEED
(A) Injection pump setting values
                                                     1st version
    Insp. values in parentheses
Set constant delivery quant.
                                                     Control-lever
                                                      position degrees: 62...70
    per values
                                                     Testing:
START OF DELIVERY
                                                     1st c-rod trav.mm : 11.00
                                                     Speed 1/min: 1140...1150
2nd c-rod trav.mm: 4.00
Test pressure, bar: 25...27
                    : 5.00...5.10
                                                                  1/min : 1200...1230
Prestroke mm
                                                        Speed
                    : (4.95...5.15)
                                                                  1/min : 1360
                                                      4th speed
Contr.-rod trav.mm: 9.00...12.00
                                                       C-rod trav.mm : 0.30...1.40
D10
```

```
LOWEST RATED SPEED I
Control-lever
 position degrees: 26...34
Setting point w/out aux. spring
              1/min : 350
Contr.-rod trav.mm: 4.0
Speed
              1/min : 350
C-rod trav.mm
                      : 4.50
C-rod trav.mm
                      : 2.00
Speed
               1/min : 440...500
FUEL-DELIVERY CHARACTERISTICS
               1/min : 1100
Del.quantity cm3/: 164.0...172.0
               1000H.: (162.0...174.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.00
Speed
               1/min : 1140...1150
STARTING FUEL DELIVERY
Speed
               1/min : 100
Del.quantity cm3/: 240.0...290.0
1000H.: (240.0...290.0)
Contr.-rod trav.mm: 20.00...21.00
LOW IDLE
Speed
               1/min : 350
Contr.-rod trav.mm: 4.40...4.60
Del.quantity cm3/: 14.0...18.0
1000H.: (-)
Dispersion cm3/: 3.00
               1000H.: (6,00)
Remarks:
Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders
to 2.9...3.1 mm.
ADDITIONAL INFORMATION
```

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania 1986-12-04 Start of delivery - engine: 15° before TDC Firing sequence of engine: 1-5-3-6-2-4.

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                       : 1- 6- 3- 2- 5- 4
                                                    Cam sequence
Note inst. in remarks column
                                                    SD ang. spacing ^{0}CS: 0-90-120-210-240-330 Tolerance + - : 0.50 (0.75)
Test sheet
                   : NWM 10,8 B
                   : 09.03.87
Edition
Superceeded
Calibrating oil
                  : ISO-4113
                                                    BASIC SETTING
Combination no.
                   : 0 402 676 802
                                                                 1/mi: 800
                                                    1st speed
                                                    Contr.-rod trav.mm: 14.90...15.00
Injection pump
Pump designation : PE6P12OA32ORS7124
EP type number
                  : 0 412 626 813
                                                    Del.quantity cm3/: 26.0...26.2
Governor
Governor design. : RSUV300...1150P0A355
                                                                  100H.: (25.7...26.5)
Governer no.
                   : 0 421 829 102
                                                    Dispersion
                                                                  cm3/:0.5
Customer-spec. information
                                                                  100H.: (0.9)
Customer
                   : MWM
                   : D-TBD 234 V6
                                                                  1/min: 300
Engine
                                                    2nd speed
                                                    Contr.-rod trav. m: 6.50...6.70
                                                    Del.quantity cm3/: 3.0...4.0
TEST BENCH REQUIREMENTS
                                                                  100H.: (2.7...4.3)
Calibrating-oil inlet temp. °C
                                                                 cm3/:0.6
                                                    Dispersion
                   : 38...42
                                                                  100H.: (1.0)
Overflow valve
                                                    SLEEVE POSITION
                   : 1 417 413 025
                                                    Control-lever position
                                                                Degree: -3
                                                                 17min: 800
Inlet press., bar : 1.50
                                                    Speed
                                                    Cont.-rod travelmm: 0.30...1.00
Calibrating nozzle-holder
               : 1 688 901 019
 assembly
                                                    Governor-spring reload
                                                    Notch setting x : 4.00
Opening
                   : 207...210
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
 pressure, bar
Perforated-plate
                                                    1st version
                   : 0.8
                                                    Speed
                                                                  1/min: 800
 diameter mm
                                                    Charge press. hPa: 900
                                                   Del.quantity cm3/: 260.0...262.0
1000H.: (257.0...265.0)
Dispersion cm3/: 5.00
                  : 1 680 750 067
Test inj. tubing
                                                                1000H.: (9.00)
Outside diameter
x Wall thickness
x Length mm
                  : 6.00x1.50x1000
                                                   HIGHEST RATED SPEED
                                                    1st version
(A) Injection pump setting values
                                                    Control-lever
    Insp. values in parentheses
Set constant delivery quant.
                                                    position degrees: 59...67
                                                    Testing:
    per values
                                                    1st c-rod trav.mm : 13.90
                                                               1/min : 1190...1200
START OF DELIVERY
                                                      Speed
                                                    2nd c-rod trav.mm : 4.00
Test pressure, bar: 25...27
                                                               1/min : 1265...1295
                                                      Speed
                   : 5.20...5.30
                                                    4th speed
                                                                1/min : 1430
Prestroke mm
                   : (5.15...5.35)
                                                     C-rod tray.mm : 0.30...1.70
Contr.-rod trav.mm: 9.00...12.00
D12
```

```
LOWEST RATED SPEED I
Control-lever
 position degrees: 17...25
Setting point w/out aux. spring
            1/min : 300
Speed
Contr.-rod trav.mm: 6.1
            1/min : 300
Speed
                 : 6.60
C-rod trav.mm
C-rod trav.mm
                 : 2.00
        1/min : 400...460
Speed
 compensator (LDA, ADA, ALDA)
1st version
Setting
             1/min : 500
Speed
            hPa : 900
Pressure
Contr.-rod trav.mm: 14.90...15.00
Measurement
            1/min : 500
Speed
1st pressure hPa : -
  C-rod trav.mm : 9.30...9.50
2nd pressure hPa : 625
  C-rod trav.mm : 14.70...14.80
3rd pressure hPa : 250
  C-rod trav.mm : 11.60...11.80
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 900
            1/min : 1150
Speed
Del.quantity cm3/: 257.0...263.0
1000H.: (254.0...266.0)
Charge press. hPa : -
            1/min : 500
Speed
Del.quantity cm3/: 128.0...132.0
             1000H.: (126.0...134.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 13.90
            1/min : 1190...1200
Speed
STARTING FUEL DELIVERY
$peed     1/min : 100
pel.quantity cm3/ : 200.0...240.0
            1000H.: (-)
Remarks:
APPLICATION
013
```

Installation 2300

```
Prestroke mm : 3.00...3.10 : (2.95...3.15)
Contr.-rod trav.mm: 9.00...12.00
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                       Cam sequence : 1-5- 3- 6- 2- 4
Test sheet
                    : VOL 12.1 D
                    : 02.06.87
Superceeded
                    : 9.86
                                                       SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Calibrating oil : ISO-4113
                    : 0 402 676 803
Combination no.
                                                       SD mark cyl. no. : 1
Injection pump
Pump designation : PE6P130A32ORS7113
                                                       BASIC SETTING
EP type number : 0 412 636 803
                                                                     1/mi: 700
Governor
                                                       1st speed
Governor design. : RSV200...900P4A521
                                                       Contr.-rod trav.mm: 12.80...12.90
Governer no. : 0 421 833 241
                                                       Del.quantity cm3/ : 27.1...27.4
Customer-spec. information
Customer
                    : VOLVO
                                                                      100H.: (26.8...27.8)
Engine
                    : TJD121LP
                                                       Dispersion
                                                                      cm3/:0.6
1st version kW : 310.0
             1/min: 1800
                                                                      100H.: (1.0)
Speed
TEST BENCH REQUIREMENTS
                                                                      1/min: 200
                                                       2nd speed
                                                       Contr.-rod trav. m: 5.00...5.20
Del.quantity cm3/: 2.5...3.0
100H.: (-)
Dispersion cm3/: 0.4
100H.: (0.8)
Calibrating-oil inlet temp. °C
                    : 38...42
Overflow valve
                    : 1 417 413 025
                                                       SLEEVE POSITION
                                                       Control-lever position
Inlet press., bar : 1.50
                                                                     Degree: -3
                                                                     17min: 800
Calibrating nozzle-holder
                                                       Cont.-rod travelmm: 0.30...0.70
               : 1 688 901 019
 assembly
Opening
                                                       Governor-spring reload
 pressure, bar : 207...210
                                                       Notch setting x : 4.00
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
Perforated-plate
                    : 0.8
 diameter mm
                                                       1st version
                                                       Speed 1/min: 700
Del.quantity cm3/: 271.5...274.5
1000H.: (268.0...278.0)
Test in ; tubing : 1 680 750 067
                                                                     cm3/ : 6.00
Outside diameter
                                                       Dispersion
x Wall thickness
                                                                     1000H.: (10.00)
x Length mm
                    : 6.00x1.50x1000
                                                       HIGHEST RATED SPEED
(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.
                                                       ist version
                                                       Control-lever
                                                        position degrees: 98...106
    per values
                                                       Testing:
START OF DELIVERY
                                                       1st c-rod trav.mm : 11.80
Test pressure, bar: 25...27
                                                         Speed 1/min: 920...925
                                                       2nd c-rod trav.mm : 4.00
D14
```

1/min : 945...975 Speed 1/min : 1130 4th speed C-rod trav.mm : 0.30...1.40 LOWEST RATED SPEED I Control-lever position degrees: 65...73 Setting point w/out aux. spring 1/min : 200 Speed Contr.-rod trav.mm: 4.6 Testing: 1/min : 100 Speed C-rod trav.mm min : 6.50 1/min : 200 Speed : 5.10 C-rod trav.mm : 2.00 C-rod trav.mm Speed 1/min : 250...300 ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 11.80 Speed 1/min : 920...925 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 510.0...540.0 1000H.: (-) Contr.-rod trav.mm: 20.00...21.00 Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     START OF DELIVERY
                                                     Test pressure, bar: 25...27
Note inst. in remarks column
                                                     Prestroke mm
                                                                         : 5.20...5.30
                   : MB 14.7 G1
: 1.9.87
Test sheet
                                                                         : (5.15...5.35)
                                                     Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 8-7-2-6-
4-1
Edition
Superceeded
                                                                                          3- 5-
Calibrating oil : ISO-4113
Combination no.
                   : 0 402 678 803
                                                     SD ang. spacing CS: 0-45-90-135-180-225-
Injection pump
Pump designation : PE8P12OA32OL$7801-1
EP type number : 0 412 628 818
                                                                           270-315
                                                     Tolerance + - 0
                                                                         : 0.50 (0.75)
Governor
Governor design. : RSV350...750POA825-3
                                                     SD mark cyl. no. : 8
Governer no. : 0 421 833 260
                                                     BASIC SETTING
Customer-spec. information
Customer
                   : DAIMLER-BENZ
                                                                    1/mi: 700
                                                     1st speed
Engine
                   : 0M442A
                                                     Contr.-rod trav.mm: 15.10...15.20
1st version kW : 240.0
                                                     Del.quantity cm3/: 23.3...23.5
Speed
             1/min: 1500
                                                                   100H.: (23.0...23.8)
TEST BENCH REQUIREMENTS
                                                     Dispersion
                                                                   cm3/:0.5
Calibrating-oil inlet temp. OC
                   : 38...42
                                                                   100H.: (0.9)
                                                     2nd speed 1/min: 350.0
Contr.-rod trav. m: 5.2...5.4
Del.quantity cm3/: 1.6...2.2
Overflow valve
                    : 1 417 413 025
                                                                   100H.: (1.3...2.5) cm3/: 0.8
Inlet press., bar : 1.50
                                                     Dispersion
                                                                   100H.: (1.2)
Overflow
 quantity min. 1/h: 100...120
                                                     SLEEVE POSITION
Calibrating nozzle-holder
                                                     Control-lever position
 assembly
             : 1 688 901 019
                                                                  Degree: -3
                                                                   17min: 800
Opening
                                                     Cont.-rod travelmm: 0.30...0.70
pressure, bar
                   : 207...210
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Perforated-plate
diameter mm
                   : 0.8
                                                     1st version
                                                     Speed
                                                                   1/min: 700
                                                     Del.quantity cm3/: 233.0...235.0
                                                                  1000H.: (230.0...238.0) cm3/ : 5.00
Test inj. tubing : 1 680 750 067
                                                     Dispersion
                                                                  1000H.: (9.00)
Outside diameter
x Wall thickness
                  : 6.00x1.50x1000
x Length mm
                                                     HIGHEST RATED SPEED
                                                     1st version
(A) Injection pump setting values
                                                     Control-lever
    Insp. values in parentheses
                                                      position degrees: 74...82
    Set constant delivery quant.
    per values ____
                                                     Testing:
                                                     1st c-rod trav.mm : 14.10
```

```
1/min : 750...755
  Speed
2nd c-rod trav.mm : 4.00
              1/min : 775...788
1/min : 1400
  Speed
4th speed
  C-rod trav.mm : 0.30...1.40
LOWEST RATED SPEED I
Control-lever
 position degrees: 60...68
Setting point w/out aux. spring
           1/min : 350
Speed
Contr.-rod trav.mm: 5.3
Testing:
Speed
              1/min : 100
C-rod trav.mm min : 19.50
            1/min : 350
Speed
                  : 5.30
C-rod trav.mm
C-rod trav.mm
                    : 2.00
             1/min : 350...410
Speed
SET IDLE AUXILIARY SPRING
Contr.-rod trav.mm: 2.00
FUEL-DELIVERY CHARACTERISTICS
Speed
             1/min : 600
Del.quantity cm3/: 233.0...239.0
1000H.: (230.0...242.0)
Dispersion cm3/: 8.0
1000H.: (12.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 14.10 peed 1/min: 750...755
Speed
STARTING FUEL DELIVERY
Speed
              1/min : 100
Del.quantity cm3/: 230.0...250.0
1000H.: (226.0...254.0)
Remarks:
APPLICATION
Generator
```

BOSCH INJ. PUMP TEST SPECIFICATIONS START OF DELIVERY Test pressure, bar: 25...27 Note inst. in remarks column : 5.20...5.30 Prestroke mm : MB 14.7 GZ : 1.9.87 : (5.15...5.35) Test sheet Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 8-7-2-6-3-5-4-1 Edition Superceeded Calibrating oil : ISO-4113 Combination no. : 0 402 678 804 SD ang. spacing CS: 0-45-90-135-180-225-Injection pump 270-315 Pump designation : PE8P120A320LS7801-1 Tolerance + - 0 : 0.50 (0.75) EP type number : 0 412 628 818 Governor Governor design. : RSV350...750P0A825-4 SD mark cyl. no. : 8 Governer no. : 0 421 833 261 BASIC SETTING Customer-spec. information Customer 1/mi: 700 : DAIMLER-BENZ 1st speed Contr.-rod trav.mm: 15.70...15.80 Engine : 0M442LA 1st version kW : 255.0 Del.quantity cm3/: 24.1...24.3 1/min: 1500 Speed 100H.: (23.8...24.6) TEST BENCH REQUIREMENTS Dispersion cm3/:0.5Calibrating-oil inlet temp. °C : 38...42 100H.: (0.9) 1/min: 350.0 Overflow valve 2nd speed Contr.-rod trav. m: 5.2...5.4 : 1 417 413 025 Del.quantity cm3/: 1.6...2.2 100H: (1.3...2.5) cm3/: 0.8 100H: (1.2) Inlet press., bar: 1.50 Dispersion Overflow quantity min. 1/h: 100...120 SLEEVE POSITION Calibrating nozzle-holder Control-lever position : 1 688 901 019 Degree: -3 assembly 17min: 800 Cont.-rod travelmm: 0.30...0.70 Opening pressure, bar : 207...210 Governor-spring reload Perforated-plate Notch setting x : 2.00 diameter mm : 0.8 FULL-LOAD DELIV. AT FULL-LOAD STOP Test inj. tubing : 1 680 750 067 1st version 1/min: 700 Speed Del.quantity cm3/: 241.0...243.0 1000H: (238.0...246.0) Dispersion cm3/: 5.00 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm 1000H.: (9.00) (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. HIGHEST RATED SPEED 1st version per values Control-lever position degrees: 74...82

```
Testing:
1st c-rod trav.mm: 14.70

Speed 1/min: 750...755

2nd c-rod trav.mm: 4.00

Speed 1/min: 775...78850

4th speed 1/min: 1400
  C-rod trav.mm : 0.30...1.40
LOWEST RATED SPEED I
Control-lever
 position degrees: 60...68
Setting point w/out aux. spring
Speed 1/min: 350
Contr.-rod trav.mm: 5.3
Testing:
Speed
                1/min : 100
C-rod trav.mm min: 19.50
              1/min : 350
.mm : 5.30
.mm : 2.00
Speed
C-rod trav.mm
C-rod trav.mm
              1/min : 350...410
Speed
SET IDLE AUXILIARY SPRING
Contra-rod trav.mm: 2.00
FUEL-DELIVERY CHARACTERISTICS
Speed 1/min: 600
Del.quantity cm3/: 246.0...252.0
1000H.: (243.0...255.0)
Dispersion cm3/: 8.0
                1000H.: (12.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 14.70
Speed
               1/min : 750...755
STARTING FUEL DELIVERY
Speed     1/min : 100
Del.quantity cm3/ : 250.0...270.0
                1000H.: (246.0...274.0)
Remarks:
APPLICATION
Generator
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     START OF DELIVERY
                                                     Test pressure, bar: 25...27
Note inst. in remarks column
                                                                         : 5.20...5.30
                                                     Prestroke mm
Test sheet
                                                                         : (5.15...5.35)
                   : MB 11,7 B
                   : 09.03.87
                                                     Contr.-rod trav.mm: 9.00...12.00
Edition
Superceeded
                   : 7.85
                                                     Cam sequence : 6-2-4-1-5-3
Calibrating oil
                 : ISO-4113
                   : 0 402 746 804
Combination no.
                                                     SD ang. spacing ^{\circ}CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Injection pump
Pump designation
                   : PES6P120A720LS7107
EP type number
                   : 0 412 726 801
                                                     SD mark cyl. no. : 6
Governor
Governor design. : RQ300/1100PA757
Governer no. : D 421 801 294
                                                     BASIC SETTING
                                                     1st speed 1/mi: 1100
Customer-spec. information
Customer
                   : DAIMLER-BENZ
                                                     Contr.-rod trav.mm: 13.40...13.50
Engine
                   : 0M427ha
                                                     Del.quantity cm3/: 19.7...19.9
1st version kW : 206.0
                                                                   100H.: (19.4...20.2)
              1/min: 2200
Speed
                                                                   cm3/:0.5
                                                     Dispersion
TEST BENCH REQUIREMENTS
                                                                   100H.: (0.9)
Calibrating-oil inlet temp. C : 38...42
                                                     2nd speed
                                                                   1/min: 300
                                                     Contr.-rod trav. m: 5.80...6.00
                                                     Del.quantity cm3/: 1.4...2.0
Overflow valve
                                                                   100H.: (1.1...2.3)
cm3/: 0.8
100H.: (1.2)
                   : 1 417 413 025
                                                     Dispersion
Inlet press., bar: 1.50
Overflow
                                                     SLEEVE POSITION
                                                     Control-lever position
 quantity min. 1/h: 100...110
                                                                  Degree: -2
Calibrating nozzle-holder
                                                     Speed
                                                                   17min: 650
            : 1 688 901 019
 assembly
                                                     Cont.-rod travelmm: 19.20...20.80
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
 pressure, bar
                   : 207...210
                                                     1st version
Perforated-plate
                                                     Speed
                                                                   1/min: 1100
                   : 0.8
                                                     Charge press. hPa : 750
diameter mm
                                                     Del.quantity cm3/: 197.0...199.0
1000H.: (194.0...202.0)
Dispersion cm3/: 5.00
1000H.: (9.00)
Test inj. tubing : 1 680 750 067
Outside diameter
x Wall thickness
                                                     HIGHEST RATED SPEED
x Length mm
                 : 6.00x1.50x1000
                                                     1st version
                                                     Control-lever
(A) Injection pump setting values
                                                      position degrees: 91...97
    Insp. values in parentheses
Set constant delivery quant.
                                                     Setting point:
    per values ____
                                                     Speed 1/min : 650
                                                     Contr.-rod trav.mm: 20.0
```

Testina: 1st c-rod trav.mm : 12.40 Speed 1/min: 1145...1160 2nd c-rod trav.mm : 4.00 Speed 1/min: 1220...1250 4th speed 1/min: 1350 C-rod trav.mm : 0.00...1.50 LOWEST RATED SPEED I Control-lever position degrees: 70...76 Setting point w/out aux. spring Speed 1/min: 300 Contr.-rod trav.mm: 5.9 Testing: 1/min : 100 Speed C-rod trav.mm min : 7.50 1/min : 300 Speed C-rod trav.mm : 5.90 nm : 2.00 1/min : 380...420 C-rod trav.mm Speed compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 Speed Pressure hРа Contr.-rod trav.mm: 10.70...11.00 Measurement 1/min : 500 Speed 1st pressure hPa : 230 C-rod trav.mm : 11.00...11.20 2nd pressure hPa : 370 C-rod trav.mm : 12.40...12.60 SWITCH-OVER POINT Speed 1/min : 220 (240) FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 750 1/min : 600 Speed Del.quantity cm3/: 195.0...198.0 1000H.: (192.0...201.0) Dispersion cm3/: 8.0 1000H.: (12.0) Charge press. hPa : -1/min : 500 Speed Del.quantity cm3/: 144.0...146.0 1000H.: (141.0...149.0)

Dispersion cm3/: 8.0 1000H.: (12.0)

ROTATIONAL-SPEED LIMITATION

1st version
1mm control-rod travel less than

full-load trav.mm: 12.40 Speed 1/min: 1145...1160

STARTING FUEL DELIVERY

Speed 1/min: 100 Del.quantity cm3/: 150.0...170.0 1000H.: (146.0...174.0)

Remarks:

Note inst. in remarks column

Test sheet : PER 12,2 A Edition : 1.9.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 402 746 807

Injection pump

Pump designation : PES6P120A720RS7121 EP type number : 0 412 726 804

Governor

Governor design. : RQV250...950P. Governor no. : 0 421 813 591 : RQV250...950PA793-1

Customer-spec. information : PERKINS Customer

: EAGLE LE Engine

1st version kW : 300.0 Speed 1/min: 1900

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder

assembly : 1 688 901 019

Opening.

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

Del.quantity cm3/: 209.0...211.0 1000H.: (206.0...214.0) Prestroke mm : 4.80...4.90 : (4.75...4.95) Contr.-rod trav.mm: 9.00...12.00 cm3/ : 6.00Dispersion Cam sequence : 1- 4- 2- 6- 3- 5 1000H.: (9.00) HIGHEST RATED SPEED 1st version SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Control-lever position degrees: 50...58 SD mark cyl. no. : 1 Testing: 1st c-rod trav.mm : 11.60 BASIC SETTING Speed 1/min: 990...1000 2nd c-rod trav.mm: 4.00 Speed 1/min: 1055...1085 4th speed 1/min: 1200 1st speed 1/mi: 700 Contr.-rod trav.mm: 12.60...12.70 C-rod trav.mm : 0.00...1.00 Del.quantity cm3/ : 20.9...21.1 LOWEST RATED SPEED I Control-lever 100H.: (20.6...21.4) position degrees: 11...19 Dispersion cm3/:0.6Testing: 1/min : 100 Speed 100H.: (0.9) C-rod trav.mm min: 6.30 Speed 1/min: 250 : 4.80...5.00 C-rod trav.mm 2nd speed 1/min: 250.0 Contr.-rod trav. m: 4.8...5.0
Del.quantity cm3/: 1.3...1.7
100H.: (-)
Dispersion cm3/: 0.3
100H.: (0.6) CONSTANT REGULATION 1/min : 250...350 Speed compensator (LDA, ADA, ALDA) (b) Setting of injection pump with externally-mounted governor 1st version Setting 1/min : 500 hPa : 900 SLEEVE TRAVELS Speed 1st speed 1/min: 250 Pressure Sleeve travel mm: 1.10...1.20 Contr.-rod trav.mm: 12.60...12.70 2nd speed 1/min: 300 Steeve travel mm: 1.70...2.00

3rd speed 1/min: 500

Steeve travel mm: 3.00...3.30

4th speed 1/min: 1000

Steeve travel mm: 8.20...8.40

5th speed 1/min: 1070 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 11.10...11.20 2nd pressure hPa : 510 5th speed 1/min: 1070 Sleeve travel mm: 9.30...9.60 C-rod trav.mm : 12.20...12.30 3rd pressure hPa : 350 SLEEVE POSITION : 11.40...11.60 C-rod trav.mm Control-lever position SWITCH-OVER POINT Degree: -1 17min: 1010 Speed Cont.-rod travelmm: 15.20...17.80 Speed 1/min : 170 (190) FULL-LOAD DELIV. AT FULL-LOAD STOP FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : -1/min : 500 1st version Speed Del.quantity cm3/: 160.0...164.0 1000H.: (158.0...166.0) Speed 1/min: 700 Charge press. hPa: 900

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11.60 Speed

1/min : 990...1000

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 130.0...170.0 1000H.: (-)

Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                    START OF DELIVERY
                                                    Test pressure, bar: 25...27
Note inst. in remarks column
                                                    Prestroke mm
                                                                       : 5.20...5.30
Test sheet
                   : MB 11.7 F
: 31.07.87
                                                                        : (5.15...5.35)
                                                    Contr.-rod trav.mm: 9.00...12.00
Edition
Superceeded
                                                                       : 6-2-4-1-5-3
                   : 9.86
                                                    Cam sequence
Calibrating oil : ISO-4113
Combination no.
                  : 0 402 746 808
                                                    SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0.50 (0.75)
Injection pump
Pump designation : PES6P120A720LS7107
EP type number : 0 412 726 801
                                                    SD mark cyl. no. : 6
Governor
Governor design. : RQ300/1100PA805
                                                    BASIC SETTING
Governer no.
                  : 0 421 801 352
                                                                   1/mi: 1100
                                                    1st speed
Customer-spec. information
                                                    Contr.-rod trav.mm: 13.40...13.50
Customer
                   : DAIMLER-BENZ
                                                    Del.quantity cm3/: 19.7...19.9
Engine
                   : 0M447ha
1st version kW : 206.0
                                                                  100H.: (19.4...20.2)
Speed
             1/min: 2200
                                                    Dispersion
                                                                  cm3/:0.5
TEST BENCH REQUIREMENTS
                                                                  100H.: (0.9)
Calibrating-oil inlet temp. °C
                                                    2nd speed 1/min: 300
Contr.-rod trav. m: 5.90...6.00
Del.quantity cm3/: 1.4...2.0
                   : 38...42
Overflow valve
                   : 1 417 413 025
                                                                  100H.: (1.1...2.3)
                                                                  cm3/: 0.8
                                                    Dispersion
                                                                  100H.: (1.2)
Iniet press., bar : 1.50
Overilow
                                                    (B) Setting of injection pump with
 quantity min. 1/h: 100...120
                                                        externally-mounted governor
Calibrating nozzle-holder
                                                    SLEEVE TRAVELS
 assembly : 1 688 901 019
                                                    1st speed 1/min: 300
Sleeve travel mm: 2.10...2.30
                                                    2nd speed 1/min: 650
Opening
                                                    Sleeve travel mm: 5.90...6.10
3rd speed 1/min: 1050
                   : 207...210
 pressure, bar
                                                      Sleeve travel mm: 6.20...6.40
Perforated-plate
                                                    4th speed 1/min: 1225
Sleeve travel mm: 9.10...9.30
 diameter mm
                   : 0.8
Test inj. tubing : 1 680 750 067
                                                    SLEEVE POSITION
                                                    Control-lever position
Outside diameter
                                                                 Degree: -2
                                                                 17min: 650
x Wall thickness
                                                    Speed
                 : 6.00x1.50x1000
                                                    Cont.-rod travelmm: 19.20...20.80
x Length mm
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
(A) Injection pump setting values
    Insp. values in parentheses
    Set constant delivery quant.
                                                    1st version
    per values
                                                    Speed
                                                                  1/min: 1100
                                                    Charge press. hPa : 750
027
```

Del.quantity cm3/: 197.0...199.0 1000H.: (194.0...202.0) cm3/ : 5.00 Dispersion 1000H.: (9.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 92...98 Setting point: 1/min : 650 Speed Contr.-rod trav.mm: 20.0 Testing: 1st c-rod trav.mm : 12.40 1/min : 1145...1160 Speed 2nd c-rod trav.mm : 4.00 1/min : 1220...1250 Speed 4th speed 1/min : 1350 C-rod trav.mm : 0.00...1.50 LOWEST RATED SPEED I Control-lever position degrees: 69...75 Setting point w/out aux. spring 1/min : 300 Speed Contr.-rod trav.mm: 5.9 Testing: Speed 1/min: 100 C-rod trav.mm min: 7.50 Speed 1/min : 300 : 5.90 C-rod trav.mm : 2.00 G-rod trav.mm Speed 1/min : 380...420 compensator (LDA,ADA,ALDA) 1st version Setting Speed  $1/\min : 500$ hPa Pressure Contr.-rod trav.mm: 11.00...11.20 Measurement 1/min : 500 Speed 1st pressure hPa : 230 C-rod trav.mm : 11.30...11.50 2nd pressure hPa : 370 : 12.70...12.90 C-rod trav.mm SWITCH-OVER POINT 1/min : 220 (240) Speed FUEL-DELIVERY CHARACTERISTICS

1st version Charge press. hPa: 750 1/min : 600 Speed Det.quantity cm3/: 193.0...196.0 1000H.: (190.0...199.0) Dispersion cm3/: 8.0 1000H.: (12.0) Charge press. hPa : -1/min : 500 Speed Del.quantity cm3/: 144.0...146.0 1000H.: (141.0...149.0) Dispersion cm3/: 8.0 1000H.: (12.0)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 12.40 Speed 1/min : 1145...1160

STARTING FUEL DELIVERY

1/min: 100 Speed Del.quantity cm3/: 150.0...170.0 1000H.: (146.0...174.0)

Note inst. in remarks column

Test sheet Edition Superceeded : PER 12,2 B : 1.9.87

Calibrating oil : ISO-4113

Combination no. : 0 402 746 809

Injection pump

Pump designation : PES6P12OA72ORS7132

EP type number : 0 412 726 806

Governor

Governor design. : RQ750PA836 Governer no. : 0 421 801 373

Customer-spec. information : PERKINS Customer

Engine : EAGLE LE

1st version kW : 240.0 1/min: 1500 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Calibrating nozzle-holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Perforated-plate

: 0.8 diameter mm

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

```
Prestroke mm
                      : 4.50...4.60
                      : (4.45...4.65)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence
                      : 1- 4- 2- 6- 3- 5
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
BASIC SETTING
                 1/mi: 700
1st speed
Contr.-rod trav.mm: 14.40...14.50
Del.quantity cm3/ : 27.4...27.8
                100H.: (27.1...28.1)
Dispersion
                cm3/:0.5
                100H.: (0.9)
2nd speed 1/min: 300.0
Contr.-rod trav. m: 7.9...8.1
Del.quantity cm3/: 3.8...4.4
                100H.: (-)
cm3/: 0.8
100H.: (1.2)
Dispersion
FULL-LOAD DELIV. AT FULL-LOAD STOP
1st version
                1/min: 700
Speed
Del.quantity cm3/: 274.0...278.0
1000H.: (271.0...281.0)
Dispersion cm3/: 5.00
               1000H.: (9,00)
HIGHEST RATED SPEED
1st version
Control-lever
 position degrees: 26...34
Testing:
1st c-rod trav.mm : 13.40
            1/min : 750...755
  Speed
2nd c-rod trav.mm : 4.00
Speed 1/min : 780...790
              1/min : 820
4th speed
                      : 0.00...1.00
  C-rod trav.mm
SWITCH-OVER POINT
              1/min : 690 (0)
Speed
ROTATIONAL-SPEED LIMITATION
1st version
```

£02

1mm control-rod travel less than

full-load trav.mm: 13.40 1/min: 750...755 Speed

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 180.0...200.0

1000H.: (-)

Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min: 300 Contr.-rod trav.mm: 7.90...8.10 Del.quantity cm3/: 38.0...44.0

1000H.: (-)

cm3/: 8.00 1000H.: (12.00) Dispersion

BOSCH INJ. PUMP TEST SPECIFICATIONS START OF DELIVERY Test pressure, bar: 25...27 Note inst. in remarks column : 5.20...5.30 Prestroke mm : MB 11,7 C1 : 09.03.87 : (5.15...5.35) Test sheet Edition Contr.-rod trav.mm: 9.00...12.00 : 6-2-4-1-5-3 Superceeded Cam sequence : ISO-4113 Calibrating oil Combination no. : 0 402 776 802 SD ang. spacing  $^{\circ}$  CS: 0-60-120-180-240-300 Tolerance + -  $^{\circ}$  : 0.50 (0.75) Injection pump Pump designation : PES6P120A720LS7120-1 : 0 412 726 808 EP type number SD mark cyl. no. : 6 Governor Governor design. : RSV350..1100POA526 BASIC SETTING Governer no. : 0 421 833 255 1/mi: 1080 1st speed Customer-spec. information Contr.-rod trav.mm: 13,20...13.30 Customer : DAIMLER-BENZ : 0M427 A Del.quantity cm3/: 19.6...19.8 Engine 1st version kW : 206.0 100H.: (19.3...20.1) Speed 1/min: 2200 Dispersion cm3/:0.5TEST BENCH REQUIREMENTS 100H.: (0.9) Calibrating-oil inlet temp. °C 2nd speed 1/min: 350.0 Contr.-rod trav. m: 5.0...5.2 Del.quantity cm3/: 1.4...2.0 : 38...42 Overflow valve : 1 417 413 025 100H.: (1.1...2.3) cm3/: 0.8 Dispersion 100H.: (1.2) Inlet press., bar : 1.50 Over flow SLEEVE POSITION Control-lever position quantity min. 1/h: 100...120 Degree: -3 17min: 800 Calibrating nozzle-holder assembly : 1 688 901 019 Cont.-rod travelmm: 0.30...1.00 Opening Governor-spring reload pressure, bar : 207...210 Notch setting x : 3.50 FULL-LOAD DELIV. AT FULL-LOAD STOP Perforated-plate diameter mm : 0.8 1st version 1/min: 1080 Speed Test inj. tubing : 1 680 750 067 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm HIGHEST RATED SPEED (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. 1st version Control-lever per values \_\_\_\_ position degrees: 48...56

```
Testing:
1st c-rod trav.mm : 12.20
             1/min: 1130...1140
  Speed
2nd c-rod trav.mm: 4.00
  Speed
             1/min: 1200...1230
4th speed
             1/min : 1350
  C-rod trav.mm
                   : 0.00...1.70
LOWEST RATED SPEED I
Control-lever
position degrees: 21...29
Setting point w/out aux. spring
             1/min : 350
Speed
Contr.-rod trav.mm: 5.6
             1/min: 350
Speed
                   : 5.60
C-rod trav.mm
SET IDLE AUXILIARY SPRING
Contr.-rod trav.mm: 2.00
 compensator (LDA,ADA,ALDA)
1st version
Setting
Speed
             1/min : 500
            hPa : 750
Pressure
Contr.-rod trav.mm: 13.20...13.30
Measurement
             1/min : 500
Speed
1st pressure hPa : 320
                   : 11.40...11.60
 C-rod trav.mm
2nd pressure hPa
                   : 10.70...10.90
  C-rod trav.mm
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa: 750
Speed 1/min: 750
Del.quantity cm3/: 202.0...206.0
             1000H.: (199.0...209.0)
             cm3/:8.0
Dispersion
             1000H.: (12.0)
Charge press. hPa : -
             1/min : 500
Speed
Del.quantity cm3/: 143.0...145.0
            1000H.: (140.0...148.0)
cm3/: 8.0
Dispersion
             1000H.: (12.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 12.20
E05
```

Speed 1/min: 1130...1140

STARTING FUEL DELIVERY

Speed 1/min: 100 Del.quantity cm3/: 180.0...200.0 1000H.: (176.0...204.0)

Remarks: Hydraulic latching of starting delivery.

Latching at 0.75 bar...0.85 bar.

Unlatching at 0.35 bar...0.45 bar.

BOSCH INJ. PUMP TEST SPECIFICATIONS START OF DELIVERY Test pressure, bar: 25...27 Note inst. in remarks column : 5.20...5.30 : (5.15...5.35) Prestroke mm Test sheet : MB 11.7 G1 : 21.08.87 Edition Contr.-rod trav.mm: 9.00...12.00 : 6-2-4-1-5-3 Superceeded Cam sequence Calibrating oil : ISO-4113 Combination no. : 0 402 776 803 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Injection pump Pump designation : PES6P120A720LS7107-1 EP type number : 0 412 726 805 SD mark cyl. no. : 6 Governor Governor design. : RSV350..750P0A520-1 BASIC SETTING Governer no. : 0 421 833 262 1/mi: 700 1st speed Customer-spec. information Contr.-rod trav.mm: 14.80...14.90 : DAIMLER-BENZ Customer Del.quantity cm3/: 22.4...22.6 Engine : 0M447 A 100H.: (22.1...22.9) 1st version kW : 180.0 Speed 1/min: 1500 cm3/ : 0.5 Dispersion TEST BENCH REQUIREMENTS 100H.: (0.9) Calibrating-oil inlet temp. °C : 38...42 1/min: 350.0 2nd speed Contr.-rod trav. m: 5.5...5.8
Del.quantity cm3/: 1.4...2.0
100H.: (1.1...2.3) Overflow valve : 1 417 413 025 cm3/:0.8Dispersion 100H.: (1.2) Inlet press., bar : 1.50 SLEEVE POSITION Overflow Control-lever position quantity min. 1/h: 100...120 Degree: -3 1/min: 800 Calibrating nozzle-holder Cont.-rod travelmm: 0.30...1.00 : 1 688 901 019 assembly Opening Governor-spring reload pressure, bar : 207...210 Notch setting x : 2.75 FULL-LOAD DELIV. AT FULL-LOAD STOP Perforated-plate diameter mm : 0.8 1st version 1/min: 700 Speed Del.quantity cm3/: 224.0...226.0 1000H.: (221.0...229.0) Dispersion cm3/: 5.00 1000H.: (9.00) : 1 680 750 067 Test inj. tubing Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm HIGHEST RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set constant delivery quant. Control-lever position degrees: 27...35 per values Testing: €06

ist c-rod trav.mm: 13.80 Speed 1/min: 750...755 2nd c-rod trav.mm : 4.00 Speed 1/min : 775...788

LOWEST RATED SPEED I Control-lever

position degrees: 35...27 Setting point w/out aux. spring 1/min : 350 Speed `

Contr.-rod trav.mm: 5.6

Testing:

1/min : 100 Speed C-rod trav.mm min: 19.50 Speed 1/min: 350 C-rod trav.mm : 5.60

SET IDLE AUXILIARY SPRING Contr.-rod trav.mm: 2.00

STARTING FUEL DELIVERY

Speed 1/min : 100 Del.quantity cm3/: 230.0...250.0 1000H.: (226.0...254.0)

Remarks: Observe VDT-I-420/120

**APPLICATION** Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS START OF DELIVERY Test pressure, bar: 25...27 Note inst. in remarks column : 5.20...5.30 Prestroke mm : MB 11.7 C2 : 1.9.87 : (5.15...5.35) Test sheet Contr.-rod trav.mm: 9.00...12.00 Edition : 6-2-4-1-5-3 Superceeded Cam sequence Calibrating oil : ISO-4113 : 0 402 776 804 Combination no. SD ang. spacing  $^{0}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{0}$ : 0.50 (0.75) Injection pump Pump designation : PES6P120A720LS7120 EP type number : 0 412 726 803 SD mark cyl. no. : 6 Governor Governor design. : RSV350..1050P0A529 BASIC SETTING Governer no. : 0 421 833 267 1/mi: 600 1st speed Customer-spec. information Contr.-rod trav.mm: 14.10...14.30 Customer : DAIMLER-BENZ : 0M447 A Del.quantity cm3/: 20.2...20.4 Engine : 210.0 100H.: (19.9...20.7) 1st version kW Speed 1/min: 2100 Dispersion cm3/:0.5TEST BENCH REQUIREMENTS 100H.: (0.9) Calibrating-oil inlet temp. C 2nd speed 1/min: 350.0 Contr.-rod trav. m: 5.6...5.8 : 38...42 Del.quantity cm3/: 1.4...2.0 Overflow valve 100H.: (1.1...2.3) cm3/: 0.8 : 1 417 413 025 Dispersion 100H.: (1.2) Inlet press., bar : 1.50 SLEEVE POSITION Over flow quantity min. 1/h: 100...120 Control-lever position Degree: -3 17min: 800 Calibrating nozzle-holder : 1 688 901 019 assembly Cont.-rod travelmm: 0.30...0.70 FULL-LOAD DELIV. AT FULL-LOAD STOP Opening pressure, bar : 207...210 1st version Speed 1/min: 600 Perforated-plate Charge press. hPa: 600 diameter mm ; 0.8 Del.quantity cm3/: 202.0...204.0 1000H.: (199.0...207.0) cm3/ : 5.00 1000H.: (9.00) Test inj. tubing : 1 680 750 067 Dispersion Outside diameter x Wall thickness HIGHEST RATED SPEED : 6.00x1.50x1000 x Length mm 1st version Control-lever position degrees: 48...56 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Testing: per values 1st c-rod trav.mm : 13.50 Speed 1/min: 1090...1100 E08

1/min: 1190...1220 Speed 1/min : 1300 4th speed : 0.30...1.40 C-rod trav.mm LOWEST RATED SPEED I Control-lever position degrees: 22...30 Setting point w/out aux. spring 1/min : 350 Speed Contr.-rod trav.mm: 5.7 1/min : 350 nm : 5.70 Speed C-rod trav.mm SET IDLE AUXILIARY SPRING Contr.-rod trav.mm: 2.00 TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1050 C-rod trav.mm : 14.80...14.90 2nd speed 1/min: 850 : 15.00...15.20 C-rod trav.mm 3rd speed 1/min: 960 C-rod trav.mm : 14.90...15.00 compensator (LDA,ADA,ALDA) 1st version Setting Speed 1/min : 600 hPa : 600 Pressure Contr.-rod trav.mm: 14.10...14.30 Measurement 1/min : 600 Speed 1st pressure hPa : 300 : 12.40...12.60 C-rod trav.mm : 400 2nd pressure hPa C-rod trav.mm : 13.40...13.60 3rd pressure hPa : 800 C-rod trav.mm : 14.60...14.80 FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 1100 1/min : 1050 Speed Del.quantity cm3/: 220.0...223.0 1000H.: (217.0...226.0) cm3/: 8.0 1000H.: (12.0) Dispersion Charge press. hPa : 1100 1/min : 800 Speed Del, quantity cm3/: 228.0...234.0 1000H.: (225.0...237.0)

2nd c-rod trav.mm: 4.00

Dispersion cm3/:8.01000H.: (12.0)

Charge press. hPa : ~ 1/min : 500 Speed

Del.quantity cm3/: 149.0...152.0 1000H.: (146.0...155.0) Dispersion cm3/: 8.0

1000H.: (12.0)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 13.50 1/min : 1090...1100 Speed

STARTING FUEL DELIVERY

1/min : 100 Speed Del.quantity cm3/: 190.0...210.0 1000H.: (186.0...214.0)

Note inst. in remarks column

Test sheet : CUM 8,3 D 1 Edition : 25.08.87 Superceeded : -

Calibrating oil : ISO-4113

: 0 403 436 102 Combination no.

Injection pump

Pump designation : PES6MW100/120RS1143 EP type number : 0 413 406 137

Governor

Governor design. : RQV300...1050MW78 Governer no. : 0 420 083 118

Customer-spec. information Customer : CUMMINS/US

: 6 CTA-830 Engine

1st version kW : 175.0 Speed 1/min: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Calibrating nozzle-holder

assembly : 1 688 901 017

Opening |

: 207...210 pressure, bar

Perforated-plate

diameter mm : 0.6

Test inj. tubing : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

Dispersion cm3/ : 3.50 Prestroke mm : 3.15...3.25 : (3.10...3.30) 1000H.: (6.00) Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5-3-6-2-4 HIGHEST RATED SPEED 1st version Control-lever position degrees: 44...52 \$D ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Testing: 1st c-rod trav.mm : 11.60 Speed 1/min: 1120...1130 2nd c-rod trav.mm: 4.00 SD mark cyl. no. : 1 Speed 1/min: 1205...1235 4th speed 1/min: 1300 C-rod trav.mm: 0.00...1.00 BASIC SETTING 1/mi: 1050 1st speed Contr.-rod trav.mm: 12.60...12.70 LOWEST RATED SPEED I Control-lever Del.quantity cm3/: 14.9...15.1 position degrees: 10...18 Setting point w/out aux. spring 100H.: (14.7...15.3) Speed 1/min : 300 Contr.-rod trav.mm: 7.7 Dispersion cm3/:0.3Testing: 100H.: (0.6) 1/min : 100 Speed C-rod trav.mm min : 9.30 2nd speed 1/min: 300.0 Speed 1/min : 300 Contr.-rod trav. m: 7.7...7.8 C-rod trav.mm : 7.70...7.80 Del.quantity cm3/: 1.6...2.0 100H.: (1.4...2.2) Dispersion cm3/: 0.3 100H.: (0.5) CONSTANT REGULATION 1/min : 320...550 Speed compensator (LDA,ADA,ALDA) (B) Setting of injection pump with externally-mounted governor 1st version SLEEVE TRAVELS Setting 1st speed 1/min: 1100 Sleeve travel mm: 7.80...8.00 1/min : 500 Speed Pressure hPa 2nd speed 1/min: 1170 Sleeve travel mm: 8.50...8.90 3rd speed 1/min: 300 Contr.-rod trav.mm: 10.00...10.10 Measurement Sleeve travel mm: 0.80...1.20 1/min : 500 Speed 4th speed 1/min: 600 Sleeve travel mm: 3.20...3.80 1st pressure hPa : 200 C-rod trav.mm : 11.00...11.10
2nd pressure hPa : 360
C-rod trav.mm : 12.00...12.30
3rd pressure hPa : 700 SLEEVE POSITION Control-lever position Degree: -1 1/min: 1150 C-rod trav.mm : 12.60...12.70 Cont.-rod travelmm: 15.20...17.80 SWITCH-OVER POINT FULL-LOAD DELIV. AT FULL-LOAD STOP Speed 1/min : 220 (230) 1st version Speed 1/min: 1050 FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : 700 Del.quantity cm3/: 149.0...151.0 1000H.: (147.0...153.0) 1st version Charge press. hPa: 700

```
1000H.: (7.00)
Charge press. hPa : -
Speed 1/min: 500
Del.quantity cm3/: 90.5...92.5
1000H.: (88.5...94.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.60
                1/min: 1120...1130
Speed
STARTING FUEL DELIVERY
Speed
                 1/min : 100
Del.quantity cm3/: 205.0...225.0
1000H.: (202.0...228.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
Speed 1/min: 300
Contr.-rod trav.mm: 7.70...7.80
Del.quantity cm3/: 16.0...20.0
1000H.: (14.0...22.0)
Dispersion cm3/: 3.50
                 1000H.: (5.50)
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence : 1- 3- 4- 2 Note inst. in remarks column SP ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) : MB 4.0 A 14 : 25.08.87 Test sheet Edition Superceeded Calibrating oil : ISO-4113 BASIC SETTING : 0 403 444 110 Combination no. 1st speed 1/mi: 1300 Injection pump Pump designation : PES4MW100/720RS1127 Contr.-rod trav.mm: 11.10...11.20 : 0 413 404 103 Del.quantity cm3/ : 8.5...8.7 EP type number Governor Governor design. : RQV300...1300MW48-1 100H.: (8.3...8.9) : 0 420 083 084 Governer no. cm3/: 0.35Dispersion Customer-spec. information 100H.: (0.6) Customer : DB 2nd speed 1/min: 300.0 Contr.-rod trav. m: 7.8...7.9 Del. quantity cm3/: 1.0...1.4 Engine : OM 364 A 1st version kW : 85.0 100H.: (0.8...1.6) Speed 1/min: 2600 cm3/ : 0.35 Dispersion 100H.: (0.5) TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC SLEEVE POSITION : 38...42 Control-lever position Degree: -1 1/min: 1330 Overflow valve Speed : 1 417 413 000 Cont.-rod travelmm: 15.20...17.80 FULL-LOAD DELIV. AT FULL-LOAD STOP Inlet press., bar: 1.50 Calibrating nozzle-holder 1st version : 0 681 343 009 1/min: 1300 assembly Speed Del.quantity cm3/: 85.0...87.0 1000H: (83.0...89.0) Dispersion cm3/: 3.50 Opening pressure, bar : 172...175 1000H.: (6.00) HIGHEST RATED SPEED Test inj. tubing : 1 680 750 008 1st version Control-lever Outside diameter x Wall thickness position degrees: 50...58 x Length mm : 6.00x2.00x600 Testing: 1st c-rod trav.mm : 10.10 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Speed 1/min: 1340...1350 2nd c-rod trav.mm : 4.00 1/min : 1430...1460 1/min : 1550 per values Speed 4th speed C-rod trav.mm : 0.00...1.00 START OF DELIVERY Test pressure, bar: 30...32 LOWEST RATED SPEED I : 3.70...3.80 Control-lever Prestroke mm : (3.65...3.85) position degrees: 17...25 Contr.-rod trav.mm: 9.00...12.00 Setting point w/out aux. spring

E13

Speed 1/min : 300 Contr.-rod trav.mm: 7.85 Testing: 1/min : 100 Speed C-rod trav.mm min : 9.50 1/min : 300 nm : 7.80...7.90 Speed C-rod trav.mm CONSTANT REGULATION Speed 1/min : 330...600 TORQUE CONTROL Torque-control curve - 1st version 1/min : 1300 1st speed : 11.10...11.20 C-rod trav.mm 1/min : 750 2nd speed C-rod trav.mm : 11.90...12.10 3rd speed 1/min: 585 C-rod trav.mm : 12.10...12.30 4th speed 1/min : 1000 C-rod trav.mm : 11.10...11.30 SWITCH-OVER POINT 1/min : 230 (250) Speed FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 750 Del.quantity cm3/: 84.5...86.5 1000H.: (82.5...88.5) Dispersion cm3/: 5.00 1000H.: (7.00) Speed 1/min: 585 Del.quantity cm3/: 80.5...83.5 1000H.: (78.5...86.5) cm3/:5.00Dispersion 1000H.: (7.00) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.10 Speed 1/min : 1340...1350 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 80.0...90.0 1000H.: (77.0...93.0) LOW IDLE Speed 1/min: 300 Contr.-rod trav.mm: 7.80...7.90 Del.quantity cm3/: 10.0...14.0 1000H.: (8.0...16.0)

Dispersion cm3/: 3.50 1000H.: (5.50)

Note inst. in remarks column

Test sheet : MB 4,0 A 19 : 25.08.87 Edition

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 403 444 112

In action pump

Pump designation : PES4MW100/720RS1127 : 0 413 404 103 EP type number

Governor

Governor design. : RQV300...1300MW48-2

: 0 420 083 110 Governer no.

Customer-spec. information Customer : DB

: OM 364 A Engine

1st version kW : 85.0 1/min: 2600 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 3- 4- 2 1/min : 300 Contr.-rod trav.mm: 7.85 Testing: SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) 1/min : 100 Speed C-rod trav.mm min : 9.50 1/min : 300 Speed BASIC SETTING C-rod trav.mm : 7.80...7.90 1/mi: 1300 CONSTANT REGULATION 1st speed 1/min : 330...600 Speed Contr.-rod trav.mm: 11.10...11.20 TORQUE CONTROL Torque-control curve - 1st version Deliquantity cm3/: 8.5...8.7 1/min: 1300 1st speed : 11.10...11.20 100H.: (8.3...8.9) C-rod trav.mm 1/min : 750 2nd speed Dispersion cm3/: 0.35C-rod trav.mm : 11.80...12.10 3rd speed 1/min: 585 100H.: (0.6) C-rod trav.mm : 12.10...12.30 4th speed 1/min: 1000 2nd speed 1/min: 300.0 Contr.-rod trav. m: 7.8...7.9 C-rod trav.mm : 11.10...11.30 2nd speed Del.quantity cm3/: 1.0...1.4 100H.: (0.8...1.6) SWITCH-OVER POINT cm3/: 0.35 100H.: (0.5) 1/min : 230 (250) Dispersion Speed FUEL-DELIVERY CHARACTERISTICS SLEEVE POSITION 1/min : 750 Speed Del.quantity cm3/: 84.5...86.5 1000H.: (82.5...88.5) Dispersion cm3/: 5.00 1000H.: (7.00) Speed 1/min: 585 Control-lever position Degree: -1 1/min: 1330 Speed Cont.-rod travelmm: 15.20...17.80 Del.quantity cm3/: 80.5...83.5 FULL-LOAD DELIV. AT FULL-LOAD STOP 1000H.: (78.5...86.5) cm3/: 5.00 1000H.: (7.00) 1st version Dispersion 1/min: 1300 Speed Del.quantity cm3/: 85.0...87.0 1000H.: (83.0...89.0) Dispersion cm3/: 3.50 ROTATIONAL-SPEED LIMITATION 1000H.: (6.00) 1st version 1mm control-rod travel less than HIGHEST RATED SPEED full-load trav.mm: 10.10 1st version 1/min: 1340...1350 Control-lever Speed position degrees: 50...58 STARTING FUEL DELIVERY Testing: 1st c-rod trav.mm : 10.10 1/min : 100 Speed 1/min: 1340...1350 Speed 2nd c-rod trav.mm : 4.00 Speed 1/min : 1430...1460 4th speed 1/min : 1550 Del.quantity cm3/: 80.0...90.0 1000H.: (77.0...93.0) C-rod trav.mm : 0.00...1.00 LOW IDLE LOWEST RATED SPEED I 1/min : 300 Speed Control-lever Contr.-rod trav.mm: 7.80...7.90 Del.quantity cm3/: 10.0...14.0 1000H.: (8.0...16.0) position degrees: 17...25 Setting point w/out aux. spring

E16

Dispersion cm3/: 3.50 1000H.: (5.50)

Note inst. in remarks column

Test sheet Edition : MB 4.0 A 20 : 25.08.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 403 444 113

Injection pump

Pump designation : PES4MW100/720RS1151

EP type number

: 0 413 404 104

Governor

Governor design. : RQV300...1300MW50-3

Governer no. : 0 420 083 129

Customer-spec. information Customer

: OM 364 LA Engine

1st version kW : 100.0 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 3- 4- 2 Control-lever position degrees: 49...57 Testing: SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) 1st c-rod trav.mm : 11.60 Speed 1/min : 1340...1350 2nd c-rod trav.mm : 4.00 BASIC SETTING 1/min: 1445...1475 Speed 4th speed 1/min: 1550 1st speed 1/mi: 1300 C-rod tray.mm : 0.00...1.00 Contr.-rod trav.mm: 12.60...12.70 LOWEST RATED SPEED I Control-lever Del.quantity cm3/: 9.8...10.0 position degrees: 16...24 Setting point w/out aux. spring Speed 1/min: 300 100H.: (9.6...10.2) Contr.-rod trav.mm: 6.8 Dispersion cm3/:0.3Testing: 100H.: (0.6) 1/min : 100 Speed C-rod trav.mm min: 8.40 2nd speed 1/min: 300 Contr.~rod trav. m: 6.8...6.9 Del.quantity cm3/: 1.0...1.4 100H.: (0.7...1.6) Dispersion cm3/: 0.3 Speed 1/min : 300 C-rod trav.mm : 6.80...6.90 CONSTANT REGULATION 1/min : 320...550 Speed 100H.: (0.5) compensator (LDA, ADA, ALDA) (B) Setting of injection pump with externally-mounted governor 1st version SLEEVE TRAVELS Setting 1/min : 500 hPa : 200 1st speed 1/min: 1340 Speed Sleeve travel mm: 8.50...8.70 Pressure Contr.-rod trav.mm: 11.30...11.40 2nd speed 1/min: 1450 Sleeve travel mm: 9.50...9.90 3rd speed 1/min: 500 Sleeve travel mm: 2.70...3.30 4th speed 1/min: 300 Sleeve travel mm: 1.30...1.70 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 10.50...10.60 SLEEVE POSITION 2nd pressure hPa : 335 C-rod trav.mm : 12.10...12.40 3rd pressure hPa : 700 Control-lever position Degree: -1 17min: 1340 C-rod trav.mm : 12.60...12.70 Speed Cont.-rod travelmm: 15.20...17.80 SWITCH-OVER POINT FULL-LOAD DELIV. AT FULL-LOAD STOP Speed 1/min : 220 (250) 1st version 1/min: 1300 FUEL-DELIVERY CHARACTERISTICS Speed Charge press. hPa: 700
Del.quantity cm3/: 98.0...100.0
1000H: (96.0...102.0)
Dispersion cm3/: 3.50 1st version Charge press. hPa: 700 Speed 1/min: 600
Del.quantity cm3/: 82.5...85.5
1000H.: (80.0...88.5)
Dispersion cm3/: 5.00
1000H.: (7.00) 1000H.: (6,00) HIGHEST RATED SPEED 1st version E19

```
Charge press. hPa: -
Speed 1/min: 500
Del.quantity cm3/: 49.0...51.0
1000H.: (47.0...53.0)

ROTATIONAL-SPEED LIMITATION

1st version
1mm control-rod travel less than
full-load trav.mm: 11.60
Speed 1/min: 1340...1350

STARTING FUEL DELIVERY

Speed 1/min: 100
Del.quantity cm3/: 85.0...95.0
1000H.: (82.0...98.0)

LOW IDLE

Speed 1/min: 300
Contr.-rod trav.mm: 6.80...6.90
Del.quantity cm3/: 10.0...14.0
1000H.: (7.5...16.5)
Dispersion cm3/: 3.50
1000H.: (5.50)

Remarks:
```

Note inst. in remarks column

Test sheet Edition Superceeded : MB 5,7 A 12 : 20.08.87 : 11.85 Calibrating oil : ISO-4113

Combination no. : 0 403 446 124

Injection pump

Pump designation : PES6MW100/720RS1101 : 0 413 406 102

EP type number

Governor

Governor design. : RQV300...1300MW34 Governer no. : 0 420 083 032

Customer-spec. information Customer : DB

Engine : 0M362LA

1st version kW : 141.0 1/min: 2600 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzl~holder assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 30...32

: 3.20...3.30 Prestroke mm : (3.15...3.35)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4 Setting point w/out aux. spring Speed 1/min: 300 Contr.-rod trav.mm: 6.0 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Testing: Speed 1/min: 100 C-rod trav.mm min: 7.60 BASIC SETTING 1/min : 300 Speed : 6.00...6.10 C-rod trav.mm 1st speed 1/mi: 1300 C-rod trav.mm : 2.00 1/min : 460...520 Speed Contr.-rod trav.mm: 11.90...12.00 compensator (LDA,ADA,ALDA) Del.quantity cm3/ : 9.4...9.6 100H.: (9.2...9.8) 1st version Setting Dispersion cm3/:0.31/min : 500 Speed Pressure hPa : -100H.: (0.6) Contr.-rod trav.mm: 10.20...10.30 2nd speed 1/min: 300.0 Measurement Contr.-rod trav. m: 6.0...6.1

Del.quantity cm3/: 1.0...1.4

100H.: (0.8...1.7)

Dispersion cm3/: 0.3 Speed 1/min : 500 1st pressure hPa : 100 C-rod trav.mm : 0.40...0.50 100H.: (0.6) 2nd pressure hPa : 125 C-rod trav.mm : 0.90...1.10 SLEEVE POSITION 3rd pressure hPa : 700 Control-lever position : 11.90...12.00 C-rod trav.mm Degree: -1 1/min: 1300 Speed SWITCH-OVER POINT Cont.-rod travelmm: 15.20...17.80 1/min: 230 (250) Speed FULL-LOAD DELIV. AT FULL-LOAD STOP FUEL-DELIVERY CHARACTERISTICS 1st version Speed 1/min: 1300 Charge press. hPa: 700 Del.quantity cm3/: 94.5...96.5 1000H.: (92.5...98.5) Dispersion cm3/: 3.50 1st version Charge press. hPa: 700 1/min: 800 Speed Del.quantity cm3/ : 92.0...96.0 1000H.: (90.0...98.0) 1000H.: (6.00) cm3/:5.0Dispersion 1000H.: (7.00) HIGHEST RATED SPEED Charge press. hPa : -1st version Speed 1/min: 500
Del.quantity cm3/: 54.5...56.5
1000H: (52.5...58.5)
Dispersion cm3/: 3.50 Control-lever position degrees: 57...65 Testing: 1000H.: (6.00) 1st c-rod trav.mm : 10,90 1/min : 1340...1350 Speed ROTATIONAL-SPEED LIMITATION 2nd c-rod trav.mm : 4.00 1/min: 1460...1490 Speed 1/min : 1600 1st version 4th speed : 0.10...1.00 1mm control-rod travel less than C-rod trav.mm LOWEST RATED SPEED I full-load trav.mm: 10.90 1/min: 1340...1350 Control-lever Speed position degrees: 16...24 **E22** 

## STARTING FUEL DELIVERY

## LOW IDLE

Note inst. in remarks column

Test sheet : MB 5,7 Å 11
Edition : 20.08.87
Superceeded : 12.83
Calibrating oil : ISO-4113

Combination no. : 0 403 446 134

Injection pump

Pump designation : PES6MW100/720RS1101 EP type number : 0 413 406 102

Governor

Governor design. : RQV300...1300MW44 Governer no. : 0 420 083 053

Customer-spec. information Customer : DB

Engine : 0M362LA

1st version kW : 141.0 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.20...3.30

: (3.15...3.35) Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4 Setting point w/out aux. spring Speed 1/min : 300 Contr.-rod trav.mm: 6.0 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Testing: 1/min: 100 Speed C-rod trav.mm min: 7.6 BASIC SETTING Speed 1/min : 300 C-rod trav.mm : 6.00...6.10 1st speed 1/mi: 1300 C-rod trav.mm : 2.00 1/min : 520...580 Speed Contr.-rod trav.mm: 11.90...12.00 compensator (LDA, ADA, ALDA) Del.quantity cm3/: 9.4...9.6 100H.: (9.2...9.8) 1st version Setting 1/min : 500 Dispersion cm3/:0.3Speed Pressure hPa : -Contr.-rod trav.mm: 10.00...10.10 100H.: (0.6) 2nd speed 1/min: 300.0 Contr.-rod trav. m: 6.0...6.1 Del.quantity cm3/: 1.0...1.4 100H.: (0.8...1.7) Dispersion cm3/: 0.3 Measurement 1/min : 500 Speed 1st pressure hPa : 100 : 0.40...0.50 C-rod trav.mm 100H.: (0.5) 2nd pressure hPa : 125 C-rod trav.mm : 0.90...1.10 3rd pressure hPa : 700 SLEEVE POSITION : 11.90...12.00 Control-lever position C-rod trav.mm Degree: -1 1/min: 1330 SWITCH-OVER POINT Speed Cont.-rod travelmm: 15.20...17.80 1/min : 230 (250) Speed FULL-LOAD DELIV. AT FULL-LOAD STOP FUEL-DELIVERY CHARACTERISTICS 1st version Speed 1/min: 1300 Charge press. hPa: 700 Del.quantity cm3/: 94.5...96.5 1000H: (92.5...98.5) Dispersion cm3/: 3.50 1st version Charge press. hPa: 700 1/min : 800 Speed Del.quantity cm3/: 92.0...96.0 1000H: (90.0...98.0) Dispersion cm3/: 5.00 1000H: (7.00) 1000H.: (6.00) HIGHEST RATED SPEED Charge press. hPa : -1st version Speed 1/min: 500 Del.quantity cm3/: 51.5...53.5 1000H.: (49.5...55.5) Control-lever position degrees: 60...68 cm3/: 3.50Testing: Dispersion 1000H.: 6.00 1st c-rod trav.mm : 10.90 Speed 1/min: 1340...1350 2nd c-rod trav.mm : 4.00 ROTATIONAL-SPEED LIMITATION 1/min : 1435...1465 1/min : 1600 Speed 4th speed 1st version C-rod trav.mm : 0.10...1.00 1mm control-rod travel less than LOWEST RATED SPEED 1 full-load trav.mm: 10.90 1/min : 1340...1350 Control-lever Speed position degrees: 7...15 £25

## 

Note inst. in remarks column

Test sheet Edition Superceeded : MB 8,7 0 : 20.08.87 : 09.83 Calibrating oil : ISO-4113

: 0 403 446 143 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1101

EP type number : 0 413 406 102

Governor

Governor design. : RQV300...1300MW44-1

Governer no. : 0 420 083 064

Customer-spec. information Customer : DB

: 0M362LA Engine

1st version kW : 141.0 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

: 3.20...3.30 Prestroke mm : (3.15...3.35)

```
Setting point w/out aux. spring
Cam sequence : 1- 5- 3- 6- 2- 4
                                                          Speed 1/min : 300
                                                          Contr.-rod trav.mm: 6.0
SD ang. spacing ^{\circ}CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                                                          Testing:
                                                          Speed 1/min: 100
C-rod trav.mm min: 7.60
BASIC SETTING
                                                          Speed
                                                                        1/min : 300
                                                                               : 6.00...6.10
                                                          C-rod trav.mm
                                                                                : 2.00
1st speed
              1/mi: 1300
                                                          C-rod trav.mm
                                                                        1/min: 520...580
                                                          Speed
Contr.-rod trav.mm: 11.90...12.00
                                                           compensator (LDA,ADA,ALDA)
Del.quantity cm3/: 9.4...9.6
               100H.: (9.2...9.8)
                                                          1st version
                                                          Setting
               cm3/:0.3
                                                                        1/min : 500
Dispersion
                                                          Speed
                                                                        hPa : -
                                                          Pressure
                                                          Contr.-rod trav.mm: 10.20...10.30
               100H.: (0.6)
2nd speed
               1/min: 300.0
                                                          Measurement
Contr.-rod trav. m: 6.0...6.1
Del.quantity cm3/: 1.0...1.4
100H.: (0.8...1.7)
Dispersion cm3/: 0.3
                                                                        1/min : 500
                                                          Speed
                                                          1st pressure hPa : 100
                                                             C-rod trav.mm
                                                                                : 0.40...0.50
                100H.: (0.5)
                                                          2nd pressure hPa : 125
                                                            C-rod trav.mm : 0.90...1.10
                                                          3rd pressure hPa : 700
SLEEVE POSITION
Control-lever position
                                                             C-rod trav.mm
                                                                                : 11.90...12.00
Degree: -1
Speed 1/min: 1330
Cont.-rod travelmm: 15.20...17.80
                                                          SWITCH-OVER POINT
                                                          Speed
                                                                        1/min : 230 (250)
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                          FUEL-DELIVERY CHARACTERISTICS
1st version
Speed
               1/min: 1300
Charge press. hPa : 700
                                                          1st version
Del.quantity cm3/: 94.5...96.5
1000H.: (92.5...98.5)
Dispersion cm3/: 3.50
                                                          Charge press. hPa : 700
                                                          Speed 1/min: 800
Del.quantity cm3/: 92.0...96.0
1000H:: (90.0...98.0)
              1000H.: (6.00)
                                                                        cm3/: 5.00
1000H.: (7.00)
                                                          Dispersion
HIGHEST RATED SPEED
                                                          Charge press. hPa : -
1st version
                                                                        1/min : 500
Control-lever
                                                          Speed
                                                          Del.quantity cm3/: 54.5...56.5
1000H.: (52.5...58.5)
Dispersion cm3/: 3.50
1000H.: 6.00
 position degrees: 60...68
Testing:
1st c-rod trav.mm : 10.90
             1/min : 1340...1350
  Speed
2nd c-rod trav.mm : 4.00
                                                          STARTING FUEL DELIVERY
              1/min: 1435...1465
  Speed
              1/min : 1600
4th speed
                     : 0.10...1.00
                                                                        1/min : 100
  C-rod trav.mm
                                                          Speed
                                                          Del.quantity cm3/: 80.0...90.0
1000H.: (77.0...93.0)
LOWEST RATED SPEED I
Control-lever
                                                          LOW IDLE
 position degrees: 7...15
E28
```

Remarks:

Set intermediate-speed stop (ZDA) to contact at 1300 1/min, then turn back 1/2 turn.

```
: 1-5-3-6-2-4
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                       Cam sequence
Note inst. in remarks column
                                                       SD ang. spacing<sup>e</sup>CS: 0-60-120-180-240-300 Tolerance + - 0.50 (0.75)
Test sheet
                    : MB 6,0 D 30
Edition
                    : 10.04.87
Superceeded
                    : ISO-4113
Calibrating oil
                                                       BASIC SETTING
Combination no.
                    : 0 403 446 145
                                                                     1/mi: 1300
                                                       1st speed
Injection pump
                                                       Contr.-rod trav.mm: 11.00...11.10
Pump designation : PES6MW100/720RS1114
                                                       Del.quantity cm3/ : 7.7...7.9
                    : D 413 406 109
EP type number
Governor
                                                                      100H.: (7.5...8.1)
Governor design.
                    : RQV300...1300MW48
                    : 0 420 083 066
Governer no.
                                                                      cm3/:0.35
                                                       Dispersion
Customer-spec. information
                                                                      100H.: (0.6)
Customer
                    : DB
                                                      2nd speed 1/min: 300.0
Contr.-rod trav. m: 7.8...7.9
Del.quantity cm3/: 0.9...1.3
100H.: (0.8...1.4)
Engine
                    : 0M366A
1st version kW
                  : 125.0
Speed
              1/min: 2600
                                                                      cm3/:0.35
                                                       Dispersion
                                                                      100H.: (0.5)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                                                       SLEEVE POSITION
                    : 38...42
                                                       Control-lever position
                                                                    Degree: -1
1/min: 1330
Overflow valve
                                                       Speed
                    : 1 417 413 000
                                                       Cont.-rod travelmm: 15.20...17.80
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
Inlet press., bar : 1.50
Calibrating nozzle-holder
                                                       1st version
                                                      Speed 1/min: 1300
Del.quantity cm3/: 77.0...79.0
1000H: (75.0...81.0)
Dispersion cm3/: 3.50
                   : 0 681 343 009
 assembly
Opening
pressure, bar
                    : 172...175
                                                                    1000H.: (6.00)
Test inj. tubing : 1 680 750 015
                                                       HIGHEST RATED SPEED
                                                       1st version
                                                       Control-lever
Outside diameter
x Wall thickness
                                                        position degrees: 48...56
                    : 6.00x1,50x600
x Length mm
                                                       Testing:
                                                       1st c-rod trav.mm : 10.00
(A) Injection pump setting values
                                                                  1/min: 1340...1350
    Insp. values in parentheses
Set constant delivery quant.
                                                         Speed
                                                       2nd c-rod trav.mm : 4.00
                                                                   1/min : 1430...1460
1/min : 1520
    per values
                                                         Speed
                                                       4th speed
                                                         C-rod tray.mm : 0.00...1.00
START OF DELIVERY
Test pressure, bar: 30...32
                                                       LOWEST RATED SPEED I
                                                       Control-lever
Prestroke mm
                    : 3.70...3.80
                    : (3.65...3.85)
                                                       position degrees: 14...22
Contr.-rod trav.mm: 9.00...12.00
                                                       Setting point #/out aux. spring
F02
```

Speed 1/min: 300 Contr.-rod trav.mm: 7.85 Testing: 1/min : 100 Speed C-rod trav.mm min: 9.40 1/min : 300 Speed C-rod trav.mm : 7.80...7.90 mm : 2.00 1/min : 500...560 C-rod trav.mm Speed CONSTANT REGULATION 1/min : 330...600 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1300 C-rod trav.mm : 11.00...11.10 2nd speed 1/min: 700 : 12.10...12.20 C-rod trav.mm 3rd speed 1/min : 720 C-rod trav.mm : 12.10...12.20 4th speed 1/min: 800 C-rod trav.mm : 11.80...12.00 5th speed 1/min: 900 : 11.40...11.70 C-rod trav.mm SWITCH-OVER POINT 1/min : 230 (250) Speed FUEL-DELIVERY CHARACTERISTICS 1/min : 700 Speed Del.quantity cm3/: 75.0...77.0 1000H.: (73.0...79.0) cm3/:5.00Dispersion 1000H.: (7.00) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.00 1/min : 1340...1350 Speed STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 72.0...80.0 1000H.: (69.0...83.0) Contr.-rod trav.mm: 19.00...21.00 LOW IDLE Speed 1/min : 300
Contr.-rod trav.mm: 7.80...7.90 Del.quantity cm3/ : 9.0...13.0 1000H.: (8.0...14.0)

F03

Dispersion cm3/: 3.50 1000H.: (5.00)

Note inst. in remarks column

Test sheet : MB 6,0 D 17 : 24.07.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 403 446 156

Injection pump

Pump designation : PES6MW100/720RS1120

: 0 413 406 112 EP type number

Governor

Governor design. : RQV300...1300MW59 Governer no. : 0 420 083 077

Customer-spec. information : MBB Customer

Engine : OM 366 LA

1st version kW : 141.7

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm

: (3.45...3.65)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2-

Setting point: Speed 1/min : 1340 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Contr.-rod trav.mm: 16.5 Testing: BASIC SETTING 1st c-rod trav.mm : 11.10 Speed 1/min: 1340...1350 2nd c-rod trav.mm : 4.00 Speed 1/min : 1440...1470 1st speed 1/mi: 1300 3rd c-rod trav.mm : 4.00 4th speed 1/min : 1530 Contr.-rod trav.mm: 12.10...12.20 Del.quantity cm3/: 8.9...9.1 C-rod trav.mm : 0.00...1.00 100H.: (8.7...9.3) LOWEST RATED SPEED I Control-lever Dispersion cm3/:0.3position degrees: 16...24 Setting point w/out aux. spring 100H.: (0.6) Speed 1/min: 300 Contr.-rod trav.mm: 6.0 1/min: 300.0 2nd speed Contr.-rod trav. m: 6.0...6.1 Del.quantity cm3/: 1.0...1.4 100H.: (0.7...1.6) Testing: 1/min : 100 Speed C-rod trav.mm min: 8.00 cm3/: 0.3 100H.: (0.5) Dispersion 1/min : 300 Speed C-rod trav.mm : 6.00...6.10 : 2.00 C-rod trav.mm (B) Setting of injection pump with externally-mounted governor CONSTANT REGULATION 1/min : 320...550 Speed SLEEVE TRAVELS 1st speed 1/min: 1340 compensator (LDA,ADA,ALDA) Sleeve travel mm: 8.50...8.60 2nd speed 1/min: 800 Sieeve travel mm: 4.40...4.80
3rd speed 1/min: 500
Sleeve travel mm: 2.70...3.30
4th speed 1/min: 300 1st version Setting 1/min : 500 hPa : 700 Speed Pressure Contr.-rod trav.mm: 12.00...12.10 Sleeve travel mm: 1.20...1.70 SLEEVE POSITION Measurement Speed 1/min: 500 C-rod trav.mm: 10.80...10.90 2nd pressure hPa: 260 Control-lever position Degree: -1 1/min: 1340 C-rod trav.mm : 11.00...11.10 3rd pressure hPa : 310\_ Cont.-rod travelmm: 15.20...17.80 FULL-LOAD DELIV. AT FULL-LOAD STOP C-rod trav.mm : 11.70...12.00 SWITCH-OVER POINT 1st version Speed 1/min: 1300 Charge press. hPa: 700 Del.quantity cm3/: 89.0...91.0 1000H.: (87.0...93.0) Dispersion cm3/: 3.50 1/min : 230 (250) Speed FUEL-DELIVERY CHARACTERISTICS 1000H.: (6.00) 1st version Charge press. hPa: 700 HIGHEST RATED SPEED Speed 1/min: 750 Del.quantity cm3/: 82.0...86.0 1000H:: (79.5...88.5) 1st version Control-lever position degrees: 48...56

F05

```
Dispersion
               cm3/:5.00
1000H.: (7.00)

Speed 1/min: 500

Del.quantity cm3/: 53.0...55.0

1000H.: (51.0...57.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.10
             1/min: 1340...1350
Speed
MIDDLE RATED SPEED
Contr.-rod trav.mm: 4.00
STARTING FUEL DELIVERY
LOW IDLE
Speed
              1/min : 300
Contr.-rod trav.mm: 6.00...6.10
Del.quantity cm3/: 10.6...14.0
1000H.: (7.5...16.5)
Dispersion cm3/: 3.50
1000H.: (5.00)
Remarks:
```

Note inst. in remarks column

Test sheet Edition Superceeded : KHD 6,1 N8 : 14,8.87

Calibrating oil : ISO-4113

Combination no. : 9 403 446 166

Injection pump

Pump designation : PES6MW100/720RS1133

: 0 413 406 126 EP type number

Governor

Governor design. : RQ325...1325MW65 Governer no. : 0 420 082 018

Customer-spec, information Customer : KHD

: BF 6L 913 BW Engine

1st version kW : 124.0 Speed 1/min: 2650

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.5

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter

x Wall thickness

: 6,00x2,00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 3,50...3,60 : (3,45...3,65)

Contr.-rod trav.mm: 9,00...12,00

```
Cam sequence : 1-5-3-6-2-4
                                                           LOWEST RATED SPEED I
                                                           Control-lever
                                                           position degrees: 8...16
Setting point w/out aux. spring
SD ang. spacing ^{\circ}CS: 0-60-120-180-240-300 Tolerance + - ^{\circ}: 0,50 (0,75)
                                                                   1/min : 8,60
                                                           Contr.-rod trav.mm: 325
BASIC SETTING
                                                           Testing:
             1/mi: 1325
                                                                         1/min : 100
1st speed
                                                           Speed
                                                           C-rod trav.mm min : 8,60
                                                                         1/min : 325
Contr.-rod trav.mm: 11,00...11,10
                                                           Speed
                                                           C-rod trav.mm : 7,00...7,10
Del.quantity cm3/: 10,1...10,3
                                                           CONSTANT REGULATION
                100H.: (9,9....10,5)
                                                                         1/min : 340...450
                                                           Speed
Dispersion
               cm3/:0.3
                                                            compensator (LDA_ADA_ALDA)
                100H.: (0,6)
                                                           1st version
2nd speed 1/min: 325
Contr.-rod trav. m: 7,00...7,10
Del.quantity cm3/: 1,1...1,5
100H.: (0,9...1,7)
Dispersion cm3/: 0,3
                                                           Setting
                                                                         1/min : 500
hPa : 700
                                                           Speed
                                                           Pressure
                                                           Contr.-rod trav.mm: 11,00...11,10
                100H.: (0.5)
                                                           Measurement
                                                           Speed
                                                                         1/min : 500
SLEEVE POSITION
Control-lever position
                                                           1st pressure hPa :
                                                           C-rod trav.mm : 9,50...9,60
2nd pressure hPa : 350
              Degree: -2
1/min: 700
Speed
Cont.-rod travelmm: 19,20...20,80
                                                             C-rod trav.mm : 10,10...10,40
                                                           3rd pressure hPa : 450
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                             C-rod trav.mm
                                                                                : 10,70...10,80
1st version
                                                           FUEL-DELIVERY CHARACTERISTICS
Speed 1/min: 1325
Charge press. hPa: 700
Del.quantity cm3/: 101.0...103.0
1000H.: (99.0...105.0)
Dispersion cm3/: 3.50
                                                           1st version
                                                           Charge press. hPa: 700
                                                                         1/min : 850
                                                           Speed
                                                           Del.quantity cm3/ : 93,0...97,0
              1000H.: (6,00)
                                                                         1000H.: (91,0...99,0)
                                                                         cm3/: 3.50
1000H: (7.00)
HIGHEST RATED SPEED
                                                           Dispersion
1st version
Control-lever
                                                           Charge press. hPa : -
                                                                         1/min : 500
 position degrees: 26...34
                                                           Speed
                                                           Del.quantity cm3/: 57.0...59.0
1000H.: (55.0...61.0)
Setting point:
          1/min : 700
Speed
Contr.-rod trav.mm: 20.0
                                                           STARTING FUEL DELIVERY
Testing:
1st c-rod trav.mm : 10,00
Speed 1/min : 1375...1385
                                                                         1/min : 100
                                                           Speed
                                                           Del.quantity cm3/: 120.0...140.0
1000H.: (117,0...143,0)
2nd c-rod trav.mm : 4,00
             1/min : 1445...1475
  Speed
              1/min : 1550
                                                           LOW IDLE
4th speed
  C-rod trav.am : 0.10...1.00
F08
```

Speed 1/min: 325 Contr.-rod trav.mm: 7,00...7,10 Del.quantity cm3/: 11,0...15,0 1000H.: (9,0...17,0) Dispersion cm3/: 3,50 1000H.: (5,00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

```
: 1-5-3-6-2-4
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                       Cam sequence
Note inst. in remarks column
                                                       SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Test sheet
                    : MB 6,0 D 26
                    : 10.08.87
Edition
Superceeded
                    : 13.05.87
                   : ISO-4113
                                                       BASIC SETTING
Calibrating oil
                    : 0 403 446 177
                                                                     1/mi: 1300
Combination no.
                                                       1st speed
                                                       Contr.-rod trav.mm: 11.00...11.10
Injection pump
Pump designation : PES6MW100/720RS1144
                    : 0 413 406 138
                                                       Del.guantity cm3/: 8.2...8.4
EP type number
Governor
                                                                      100H.: (8.0...8.6)
Governor design.
                    : RQV300...1300MW48
Governer no.
                    : 0 420 083 066
                                                       Dispersion
                                                                      cm3/:0.3
Customer-spec. information
Customer
                                                                      100H.: (0.6)
                                                       2nd speed 1/min: 300.0
Contr.-rod trav. m: 7.8...7.9
Del.quantity cm3/: 1.0...1.4
100H.: (0.9...1.5)
Dispersion cm3/: 0.3
Engine
                    : 0M366A
1st version kW : 125.0
              1/min: 2600
Speed
TEST BENCH REQUIREMENTS
                                                                      100H.: (0.5)
Calibrating-oil inlet temp. OC
                                                        (B) Setting of injection pump with
                    : 38...42
                                                            externally-mounted governor
                                                       SLEEVE TRAVELS
Overflow valve
                    : 1 417 413 000
                                                       1st speed 1/min: 1340
                                                         Sleeve travel mm: 8.50...8.70
                                                       2nd speed 1/min: 1450
Inlet press., bar : 1.50
                                                         Sleeve travel mm: 9.30...9.70
                                                       3rd speed 1/min: 500
Calibrating nozzle-holder
                                                       Sleeve travel mm: 2.70...3.30
4th speed 1/min: 300
Sleeve travel mm: 1.20...1.70
 assembly
                   : 0 681 343 009
Opening
 pressure, bar
                    : 172...175
                                                       SLEEVE POSITION
                                                       Control-lever position
                                                                     Degree: -1
                    : 1 680 750 008
Test inj. tubing
                                                                      17min: 1350
                                                       Speed
                                                       Cont.-rod travelmm: 15.20...17.80
Outside diameter
x Wall thickness
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
                    : 6.00x2.00x600
x Length mm
(A) Injection pump setting values
                                                       1st version
    Insp. values in parentheses
Set constant delivery quant.
                                                                      1/min: 1300
                                                       Speed
                                                       Del.quantity cm3/: 82.0...84.0
                                                                    1000H.: (80.0...86.0)
cm3/ : 3.50
1000H.: (6.00)
    per values
                                                       Dispersion
START OF DELIVERY
Test pressure, bar: 30...32
                                                       HIGHEST RATED SPEED
Prestroke mm
                    : 3.70...3.80
                                                       1st version
                    : (3.65...3.85)
                                                       Control-lever
Contr.-rod trav.mm: 9.00...12.00
                                                        position degrees: 50...58
F10
```

Testing: 1st c-rod trav.mm : 10.00 Speed 1/min : 1340...1350 2nd c-rod trav.mm : 4.00 1/min : 1425...1455 Speed 4th speed 1/min: 1550 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 18...26 Setting point w/out aux. spring Speed 1/min : 300 Contr.-rod trav.mm: 7.8 Testing: 1/min : 100 Speed C-rod trav.mm min : 8.70 1/min : 300 Speed C-rod trav.mm : 7.80...7.90 CONSTANT REGULATION 1/min : 330...500 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1300 C-rod trav.mm : 11.00...11.10 1/min : 800 2nd speed C-rod trav.mm : 11.80...12.00 d speed 1/min : 585 3rd speed C-rod trav.mm : 12.00...12.20 4th speed 1/min : 1100 : 11.00...11.10 C-rod trav.mm SWITCH-OVER POINT Speed 1/min : 230 (250) FUEL-DELIVERY CHARACTERISTICS 1/min : 800 Speed Del.quantity cm3/: 81.0...83.0 1000H.: (79.0...85.0) cm3/:5.00Dispersion 1000H.: (7.00)
Speed 1/min: 585
Del.quantity cm3/: 77.5...80.5 1000H.: (75.0...83.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.00 1/min : 1340...1350 Speed STARTING FUEL DELIVERY

LOW IDLE

Speed 1/min : 300 Contr.-rod trav.mm: 7.80...7.90 Del.quantity cm3/: 10.0...14.0 1000H.: (9.0...15.0) cm3/: 3.50 1000H.: (5.00) Dispersion

Remarks:

Note inst. in remarks column

Test sheet Edition Superceeded : IHC 7,6 R14

: 31.07.87

Calibrating oil : 780-4113

: 0 403 446 183 Combination no.

Injection pump

Pump designation : PES6MW100/320RS1112

EP type number : 0 413 406 108

Governor

Governor design. : RQV350...1300MW46-11 Governer no. : 0 420 083 120

Customer-spec. information Customer : NAVISTAR

: DT-466 C Engine

1st version kW : 154.5 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar : 2.80

Calibrating nozzle-holder

: 1 688 901 016 assembly

Opening

pressure, bar : 207...210

Per for ated-plate

: 0.5 diameter mm

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Prestroke mm : 3.95...4.05 HIGHEST RATED SPEED (3.90...4.10) 1st version Contr.-rod trav.mm: 9.00...12.00 Control-lever Cam sequence : 1-5-3-6-2-4 position degrees: 45...50 Testing: 1st c-rod trav.mm : 10.00 Speed 1/min : 1345...1365 SD ang. spacing  $^{0}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{0}$ : 0.50 (0.75) 2nd c-rod trav.mm: 4.00 Speed 1/min: 1455...1465 4th speed 1/min: 1500 BASIC SETTING C-rod tray.mm : 0.00...1.00 1/mi: 900 1st speed LOWEST RATED SPEED I Contr.-rod trav.mm: 11.00...11.10 Control-lever position degrees: 10...18 Del.quantity cm3/ : 10.6...10.8 Setting point w/out aux. spring 1/min : 350 100H.: (10.4...11.0) Contr.-rod trav.mm: 5.7 Testing: Dispersion cm3/:0.3Speed 1/min : 100 C-rod trav.mm min : 9.00 Speed 1/min : 350 100H.: (0.6) 2nd speed 1/min: 350.0 Contr.-rod trav. m: 5.7...5.8 C-rod trav.mm : 5.70...5.80 Del.quantity cm3/: 1.6...2.0 CONSTANT REGULATION 1/min : 300...450 100H.: (1.3...2.2) Speed cm3/: 0.3 100H.: (0.5) Dispersion compensator (LDA, ADA, ALDA) (B) Setting of injection pump with externally-mounted governor 1st version Setting SLEEVE TRAVELS 1/min : 500 Speed hPa : 170 1st speed 1/min: 1350 Pressure Sleeve travel mm: 8.30...8.50 Contr.-rod trav.mm: 10.20...10.30 2nd speed 1/min: 1460
Sleeve travel mm: 9.10...9.50
3rd speed 1/min: 550
Sleeve travel mm: 3.10...3.70
4th speed 1/min: 350 Measurement 1/min : 500 Speed 1st pressure hPa : -: 9.90...10.00 Sleeve travel mm: 1.30...1.70 C-rod trav.mm 2nd pressure hPa : 315 C-rod trav.mm : 10.60...10.90 SLEEVE POSITION 3rd pressure hPa : 700 Control-lever position Degree: -1 1/min: 1380 C-rod trav.mm : 11.00...11.10 Cont.-rod travelmm: 6.60...9.40 SWITCH-OVER POINT FULL-LOAD DELIV. AT FULL-LOAD STOP 1/min : 220 (210) Speed FUEL-DELIVERY CHARACTERISTICS 1st version Speed 1/min: 900 Charge press. hPa: 700 Del.quantity cm3/: 106.5...108.5 1000H.: (104.5...110.5) 1st version Charge press. hPa : 700 Dispersion cm3/ : 3.50 Speed 1/min: 1300 1000H.: (6.00) Del.quantity cm3/: 108.0...112.0 1000H.: (106.0...114.0)

```
Dispersion
                 cm3/:6.50
                1000H.: (7.00)
Charge press. hPa : -
Speed 1/min: 500
Del.quantity cm3/: 81.5...83.5
1000H:: (79.5...85.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.00
Speed
                1/min : 1345...1365
STARTING FUEL DELIVERY
Speed
                1/min : 100
Del.quantity cm3/: 140.0...180.0
1000H.: (137.0...183.0)
Contr.-rod tray.mm: 19.00...21.00
LOW IDLE
Speed
                1/min : 350
Contr.-rod trav.mm: 5.70...5.80
Del.quantity cm3/: 16.0...20.0
1000H:: (13.5...22.5)
Dispersion cm3/: 3.50
1000H:: (5.50)
Remarks:
Perform pump setting only with IH hose with restriction of 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 \text{ 1/min}
Set low idle at stop screw.
Set shutoff stop 1.5...2.0 mm before
shutoff.
Before checking sleeve position,
```

F14

first adjust latching.

Note inst. in remarks column

Test sheet Edition Superceeded : IHC 7,6 R15 : 31.07.87

Calibrating oil : ISO-4113

: 0 403 446 185 Combination no.

Injection pump

Pump designation : PES6MW100/320RS1140

EP type number : 0 413 406 135

Governor

Governor design. : RQV350...1200MW72-1

Governer no. : 0 420 083 122

Customer-spec. information Customer : NAVISTAR

: DT-466 C Engine

1st version kW : 134.0 Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar : 2.80

Calibrating nozzle-holder

: 1 688 901 016 assembly

Opening

pressure, bar : 207...210

Perforated-plate

: 0.5 diameter mm

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

```
: 3.95...4.05
: (3.90...4.10)
Prestroke mm
                                                          1st version
                                                          Control-lever
Contr.-rod trav.mm: 9.00...12.00
                                                           position degrees: 42...47
Cam sequence
                     : 1-5-3-6-2-4
                                                          Testina:
                                                          1st c-rod trav.mm : 10.40
                                                            Speed 1/min: 1250...1270
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                                                          2nd c-rod trav.mm : 4.00
                                                          Speed 1/min: 1360...1370
4th speed 1/min: 1450
BASIC SETTING
                                                            C-rod trav.mm : 0.00...1.00
              1/mi: 800
                                                          LOWEST RATED SPEED I
1st speed
                                                          Control-lever
Contr.-rod trav.mm: 11.40...11.50
                                                           position degrees: 10...18
                                                          Setting point w/out aux. spring
Del.quantity cm3/: 9.1...9.3
                                                          Speed 1/min : 350
                                                          Contr.-rod trav.mm: 6.6
                100H.: (8.9...9.5)
                                                          Testing:
Dispersion
               cm3/:0.3
                                                                        1/min : 100
                                                          Speed `
                                                          C-rod trav.mm min : 9.00
                                                          Speed 1/min : 350
                100H.: (0.6)
                                                          C-rod trav.mm
                                                                               : 6.60...6.70
               1/min: 350.0
2nd speed
Contr.-rod trav. m: 6.6...6.7

Del.quantity cm3/: 1.6...2.0

100H.: (1.3...2.2)

Dispersion cm3/: 0.3
                                                          CONSTANT REGULATION
                                                                        1/min: 370...500
                                                          Speed
                                                          SWITCH-OVER POINT
                100H.: (0.5)
                                                                        1/min: 280 (290)
                                                          Speed
(B) Setting of injection pump with
                                                          FUEL-DELIVERY CHARACTERISTICS
     externally-mounted governor
                                                                        1/min : 1200
                                                          Speed
                                                          Del.quantity cm3/: 94.0...98.0
1000H.: (92.0...100.0)
Dispersion cm3/: 6.50
1000H.: (7.00)
SLEEVE TRAVELS
1st speed 1/min: 1250
Sleeve travel mm: 7.80...8.00
2nd speed 1/min: 1340
Sleeve travel mm: 8.80...9.20
3rd speed 1/min: 500
                                                          ROTATIONAL-SPEED LIMITATION
  Sleeve travel mm: 2.60...3.20
4th speed 1/min: 350
                                                          1st version
  Sleeve travel mm: 1.30...1.80
                                                          1mm control-rod travel less than
SLEEVE POSITION
                                                           full-load trav.mm: 10.40
                                                                        1/min : 1250...1270
Control-lever position
                                                          Speed
              Degree: -1
               1/min: 1380
                                                          STARTING FUEL DELIVERY
Cont.-rod travelmm: 6.70...9.30
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                                       1/min : 100
                                                          Speed
                                                          Del.quantity cm3/: 140.0...180.0
                                                          1000H.: (137.0...183.0)
Contr.-rod trav.mm: 19.00...21.00
1st version
Speed 1/min: 800
Del.quantity cm3/: 91.5...93.5
1000H.: (89.5...95.5)
Dispersion cm3/: 3.50
                                                          LOW IDLE
              1000H.: (6.00)
                                                          Speed
                                                                       1/min : 350
                                                          Contr.-rod trav.mm: 6.60...6.70
HIGHEST RATED SPEED
```

F16

Del.quantity cm3/: 16.0...20.0 1000H.: (13.5...22.5) Dispersion cm3/: 3.50 1000H.: (5.50) Perform pump setting only with IH

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

```
Cam sequence : 1-5-3-6-2-4
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
Test sheet
Edition
Superceeded
                                                           SD ang. spacing ^{0}CS: 0-60-120-180-240-300 Tolerance + - ^{0}: 0.50 (0.75)
                      : MB 6,0 D 21
                     : 10.08.87
                     : 09.03.87
Calibrating oil : ISO-4113
                                                           BASIC SETTING
Combination no.
                      : 0 403 446 187
                                                                         1/mi: 1300
                                                           1st speed
Injection pump
                                                           Contr.-rod trav.mm: 11.20...11.30
Pump designation : PES6MW100/720RS1129
EP type number : 0 413 406 121
                                                           Del.quantity cm3/ : 9.3...9.5
Governor
Governor design. : RQV300...1300MW50-2
                                                                          100H.: (9.1...9.7)
Governer no.
                     : 0 420 083 124
                                                           Dispersion
                                                                          cm3/:0.3
Customer-spec. information
Customer
                     : DB
                                                                          100H.: (0.6)
                                                          2nd speed 1/min: 300.0
Contr. rod trav. m: 5.5...5.6
Del.quantity cm3/: 1.0...1.2
100H.: (0.8...1.6)
Dispersion cm3/: 0.3
                      : DM 366 LA
Engine
1st version kW : 150.0
               1/min: 2600
Speed
TEST BENCH REQUIREMENTS
                                                                          100H.: (0.5)
Calibrating-oil inlet temp. <sup>D</sup>C
                                                           (B) Setting of injection pump with
                      : 38...42
                                                                externălly-mounted governor
Overflow valve
                                                           SLEEVE TRAVELS
                      : 1 417 413 000
                                                           1st speed 1/min: 1340
                                                             Sleeve travel mm: 8.60...8.80
                                                           2nd speed 1/min: 1430
Sleeve travel mm: 9.30...9.70
3rd speed 1/min: 300
Inlet press., bar : 1.50
Calibrating nozzle-holder
                   : 0 681 343 009
                                                           Sleeve travel mm: 1.20...1.60
4th speed 1/min: 700
 assembly
                                                             Sleeve travel mm: 3.80...4.40
Opening
pressure, bar : 172...175
                                                           SLEEVE POSITION
                                                           Control-lever position
Test inj. tubing : 1 680 750 008
                                                                         Degree: -1
1/min: 1340
                                                           Speed
                                                           Cont.-rod travelmm: 15.20...17.80
Outside diameter
x Wall thickness
                    : 6.00x2.00x600
                                                           FULL-LOAD DELIV. AT FULL-LOAD STOP
x Length mm
(A) Injection pump setting values
                                                           1st version
                                                          Speed 1/min: 1300
Charge press. hPa: 700
Del.quantity cm3/: 93.0...95.0
1000H: (91.0...97.0)
Dispersion cm3/: 3.50
     Insp. values in parentheses
Set constant delivery quant.
    per values
START OF DELIVERY
                                                                         1000H.: (6.00)
Test pressure, bar: 30...32
Prestroke mm
                      : 3.70...3.80
                                                           HIGHEST RATED SPEED
                      : (3.65...3.85)
                                                           1st version
Contr.-rod trav.mm: 9.00...12.00
F18
```

Control-lever position degrees: 51...59 Testing: 1st c-rod trav.mm : 10.20 Speed 1/min: 1340...1350 2nd c-rod trav.mm : 4.00 1/min : 1430...1460 1/min : 1550 Speed 4th speed C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 15...23 Setting point w/out aux. spring Speed 1/min: 300 Contr.-rod trav.mm: 5.5 Testing: Speed 1/min : 100 C-rod trav.mm min : 7.50 Speed 1/min : 300 : 5.50...5.60 C-rod trav.mm SET IDLE AUXILIARY SPRING Contr.-rod trav.mm: 2.00 CONSTANT REGULATION Speed 1/min : 320...530 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 Speed Pressure hPa : 400 Contr.-rod trav.mm: 9.90...10.0 Measurement Speed 1/min : 500 1st pressure hPa : -: 9.50...9.60 C-rod trav.mm : 500 2nd pressure hPa : 10.80...11.10 : 700 C-rod trav.mm 3rd pressure hPa : 11.20...11.30 C-rod trav.mm SWITCH-OVER POINT Speed 1/min : 220 (230) FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : -Speed 1/min : 500 Del.quantity cm3/ : 53.0...55.0 1000H.: (51.0...57.0) ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 10.20 Speed 1/min: 1340...1350

STARTING FUEL DELIVERY

Speed 1/min: 100 Del.quantity cm3/: 90.0...100.0 1000H.: (87.0...103.0)

LOW IDLE

1000H.: (5.00)

Remarks:

Note inst. in remarks column

Test sheet : IHC 7,6 R22 Edition : 10.08.87 Superceeded : -

Calibrating oil : ISO-4113

Combination no. : 0 403 446 192

Injection pump

Pump designation : PES6MW100/320RS1112

EP type number : 0 413 406 108

Governor

Governor design. : RQV350...1300MW72-2

Governer no. : 0 420 083 141

Customer-spec. information Customer : NAVISTAR

: DT-466 Engine

1st version kW : 136.0 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar : 2.80

Calibrating nozzle-holder

: 1 688 901 016 assembly

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Prestroke mm : 3.954.05	1st version Control-lever position degrees: 4449 Testing: 1st c-rod trav.mm : 9.40
SD ang. spacing CS: 0-60-120-180-240-300	Speed 1/min: 13601380 2nd c-rod trav.mm: 4.00 Speed 1/min: 14601470 4th speed 1/min: 1500 C-rod trav.mm: 0.001.00
1st speed 1/mi: 900  Contrrod trav.mm: 10.3010.40  Del.quantity cm3/: 8.99.1  100H.: (8.79.3)	LOWEST RATED SPEED I Control-lever position degrees: 1018 Setting point w/out aux. spring Speed 1/min: 350 Contrrod trav.mm: 6.1 Testing:
Dispersion cm3/: 0.3	Speed 1/min: 100 C-rod trav.mm min: 9.00 Speed 1/min: 350 C-rod trav.mm: 6.106.20
<pre>2nd speed  1/min: 350.0 Contrrod trav. m: 6.16.2 Del.quantity cm3/: 1.62.0</pre>	CONSTANT REGULATION Speed 1/min: 300450
Dispersion cm3/: 0.3   1   100H.: (0.5)	SWITCH-OVER POINT  Speed 1/min : 220 (210)
(B) Setting of injection pump with externally-mounted governor  SLEEVE TRAVELS  1st speed 1/min: 1350 Sleeve travel mm: 8.308.50  2nd speed 1/min: 1460 Sleeve travel mm: 9.109.50  3rd speed 1/min: 550 Sleeve travel mm: 3.103.70  4th speed 1/min: 350 Sleeve travel mm: 1.301.70	FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 1300 Del.quantity cm3/: 91.595.5 1000H.: (89.597.5) Dispersion cm3/: 6.50 1000H.: (7.00)  ROTATIONAL-SPEED LIMITATION  1st version 1mm control-rod travel less than
SLEEVE POSITION  Control-lever position  Degree: -1  Speed 1/min: 1380  Controd travelmm: 6.609.40	full-load trav.mm: 9.40 Speed 1/min: 13601380 STARTING FUEL DELIVERY
FULL-LOAD DELIV. AT FULL-LOAD STOP  1st version Speed 1/min: 900 Del.quantity cm3/: 89.591.5 1000H.: (87.593.5) Dispersion cm3/: 3.50 1000H.: (6.00) HIGHEST RATED SPEED	<pre>Speed     1/min : 100 Del.quantity cm3/ : 140.0180.0</pre>

Del.quantity cm3/: 16.0...20.0 1000H.: (13.5...22.5) Dispersion cm3/: 3.50 1000H.: (5.50)

Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking significant adjust latching. Before checking sleeve position,

In unlatched condition, do not operate greater than n = 500 1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                          : 3.95...4.05
                                                      Prestroke mm
                                                                          : (3.90...4.10)
                                                      Contr.-rod trav.mm: 9.00...12.00
Note inst. in remarks column
                                                       Cam sequence : 1-5-3-6-2-4
Test sheet
                    : IHC 7,6 S
                    : 10.08.87
Edition
Superceeded
                                                      SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Calibrating oil
                   : ISO-4113
Combination no.
                    : 0 403 446 193
                                                      BASIC SETTING
Injection pump
Pump designation : PES6MW100/320RS1159
                                                      1st speed
                                                                     1/mi: 900
EP type number
                    : 0 413 406 146
                                                      Contr.-rod trav.mm: 11.00...11.10
Governor
Governor design. : RQV350...1300MW72-3
Governer no. : 0 420 083 142
                                                      Del.quantity cm3/ : 9.5...9.7
                                                                     100H.: (9.3...9.9)
Customer-spec. information
Customer
                    : NAVISTAR
                                                                     cm3/:0.3
                                                      Dispersion
Engine
                    : DT-466
                                                                     100H.: (0.6)
1st version kW : 136.0
              1/min: 2600
                                                                     1/min: 350.0
Speed
                                                      2nd speed
                                                      Contr.-rod trav. m: 6.4...6.5
                                                      Del.quantity cm3/: 1.6...2.0
100H.: (1.3...2.2)
Dispersion cm3/: 0.3
100H.: (0.5)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                    : 38...42
Overflow valve
                                                       (B) Setting of injection pump with
                    : 2 417 413 037
                                                           externally-mounted governor
Inlet press., bar : 2.80
                                                      SLEEVE TRAVELS
                                                      1st speed 1/min: 1250
Sleeve travel mm: 7.80...8.00
2nd speed 1/min: 1340
Sleeve travel mm: 8.80...9.20
Calibrating nozzle-holder
 assembly
               : 1 688 901 016
                                                      3rd speed 1/min: 500
Opening
                    : 207...210
                                                         Sleeve travel mm: 2.60...3.20
 pressure, bar
                                                      4th speed 1/\min: 350
                                                        Sleeve travel mm: 1.30...1.80
Perforated-plate
 diameter mm
                    : 0.5
                                                      SLEEVE POSITION
                                                      Control-lever position
Test inj. tubing : 1 680 750 008
                                                                   Degree: -1
                                                                    1/min: 1380
Outside diameter
                                                      Cont.-rod travelmm: 6.70...9.30
x Wall thickness
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
x Length mm
                    : 6.00x2.00x600
(A) Injection pump setting values
                                                      1st version
                                                                    1/min: 900
    Insp. values in parentheses
                                                      Speed
    Set constant delivery quant.
                                                      Del.quantity cm3/: 95.0...97.0
                                                                   1000H.: (93.0...99.0)
cm3/ : 3.50
1000H.: (6.00)
    per values ____
                                                      Dispersion
START OF DELIVERY
Test pressure, bar: 30...32
                                                      HIGHEST RATED SPEED
F23
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1st version Control-lever position degrees: 46...51 Testing: 1st c-rod trav.mm : 10.00 1/min: 1370...1390 Speed 2nd c-rod trav.mm: 4.00 1/min : 1475...1485 Speed 1/min: 1450 4th speed C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 11...19 Setting point w/out aux. spring 1/min : 350 Speed Contr.-rod trav.mm: 6.4 Testing: 1/min : 100 Speed C-rod trav.mm min : 9.00 1/min : 350 Speed C-rod trav.mm : 6.40...6.50 CONSTANT REGULATION 1/min : 370...500 Speed SWITCH-OVER POINT Speed 1/min : 280 (290) FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 1200 Del.quantity cm3/: 99.5...103.5 1000H.: (97.5...105.5) cm3/: 6.50 Dispersion 1000H.: (7.00) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.00 1/min : 1370...1390 Speed STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/ : 140.0...180.0 1000H.: (137.0...183.0) Contr.-rod trav.mm: 19.00...21.00 LOW IDLE 1/min : 350 Speed Contr.-rod trav.mm: 6.40...6.50

Del.quantity cm3/: 16.0...20.0 1000H.: (13.5...22.5) Dispersion cm3/: 3.50 1000H.: (5.50) Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than  $n=500\ 1/\text{min}$ 

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.95...4.05 Prestroke mm : (3.90...4.10) Contr.-rod trav.mm: 9.00...12.00 Note inst. in remarks column Cam sequence : 1-5-3-6-2-4 : IHC 7.6 R20 : 31.07.87 Test sheet Edition Superceeded SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Calibrating oil : ISO-4113 Combination no. : 0 403 446 194 BASIC SETTING Injection pump Pump designation : PES6MW100/320RS1112 1/mi: 900 1st speed EP type number : 0 413 406 108 Contr.-rod trav.mm: 10.80...10.90 Governor Governor design. : RQV350...1300MW46-12 Governer no. : 0 420 083 143 Del.quantity cm3/: 10.3...10.5 Customer-spec. information 100H.: (10.1...10.7) Customer : NAVISTAR cm3/:0.3Dispersion Engine : DT-466 100H.: (0.6) 1st version kW : 154.5 2nd speed 1/min: 350.0 Contr.-rod trav. m: 5.5...5.6 Speed 1/min: 2600 Del.quantity cm3/: 1.6...2.0 TEST BENCH REQUIREMENTS 100H.: (1.3...2.2) cm3/: 0.3 100H.: (0.5) Calibrating-oil inlet temp. °C Dispersion : 38...42 Overflow valve (B) Setting of injection pump with : 2 417 413 037 externally-mounted governor Inlet press., bar : 2.80 SLEEVE TRAVELS 1st speed 1/min: 1350 Steeve travel mm: 8.30...8.50

2nd speed 1/min: 1460

Steeve travel mm: 9.10...9.50

3rd speed 1/min: 550

Steeve travel mm: 3.10...3.70

4th speed 1/min: 350 Calibrating nozzle-holder : 1 688 901 016 assembly Opening : 207...210 pressure, bar Sleeve travel mm: 1.30...1.70 Perforated-plate : 0.5 diameter mm SLEEVE POSITION Control-lever position Test inj. tubing : 1 680 750 008 Degree: -1 17min: 1380 Speed Cont.-rod travelmm: 6.60...9.20 Outside diameter x Wall thickness : 6.00x2.00x600 FULL-LOAD DELIV. AT FULL-LOAD STOP x Length mm (A) Injection pump setting values 1st version Insp. values in parentheses Set constant delivery quant. 1/min: 900 Speed Charge press. hPa: 800 Del.quantity cm3/: 103.0...105.0 1000H:: (101.0...107.0) Dispersion cm3/: 3.50 per values START OF DELIVERY 1000H.: (6.00) Test pressure, bar: 30...32

HIGHEST RATED SPEED Dispersion cm3/:6.501000H.: (7.00) 1st version Control-lever Charge press. hPa : -Speed 1/min: 500 Del.quantity cm3/: 87.0...89.0 1000H.: (85.0...91.0) position degrees: 43...48 Testing: 1st c-rod trav.mm : 9.80 Speed 1/min: 1350...1370 ROTATIONAL-SPEED LIMITATION 2nd c-rod trav.mm: 4.00 1/min: 1455...1465 Speed 1st version 4th speed 1/min : 1500 1mm control-rod travel less than C-rod trav.mm : 0.00...1.00 full-load trav.mm: 9.80 LOWEST RATED SPEED I 1/min : 1350...1370 Speed Control-lever STARTING FUEL DELIVERY position degrees: 7...15 Setting point w/out aux. spring 1/min : 350 Speed Contr.-rod trav.mm: 5.5 1/min : 100 Speed Del.quantity cm3/ : 140.0...180.0 1000H.: (137.0...183.0) Contr.-rod trav.mm: 19.00...21.00 Testing: Speed 1/min : 100 C-rod trav.mm min: 9.00 Speed 1/min: 350 LOW IDLE C-rod trav.mm : 5,50...5.60 1/min : 350 Speed Confr.-rod trav.mm: 5.50...5.60 CONSTANT REGULATION Del.quantity cm3/: 16.0...20.0 1000H:: (13.5...22.5) Dispersion cm3/: 3.50 1000H:: (5.50) 1/min : 360...450 Speed compensator (LDA,ADA,ALDA) 1st version Remarks: Setting Perform pump setting only with IH hose with restriction of 1.2 mm diameter. 1/min : 500 Speed Pressure hPa : 170 Contr.-rod trav.mm: 10.30...10.40 Measurement 1/min : 500 Speed Before checking sleeve position, 1st pressure hPa first adjust latching. C-rod trav.mm : 10.10...10.20 2nd pressure hPa ; 230 : 10.60...10.80 : 800 C-rod trav.mm 3rd pressure hPa C-rod trav.mm : 10.80...10.90 In unlatched condition, do not operate greater than n = 500 1/min SWITCH-OVER POINT Speed 1/min : 280 (290) FUEL-DELIVERY CHARACTERISTICS Set low idle at stop screw. 1st version Charge press. hPa : 800 1/min : 1300 Speed Del.quantity cm3/ : 103.0...107.0 Set shutoff stop 1.5...2.0 mm before 1000H.: (101.0...109.0) 1 shutoff. F26

Note inst. in remarks column

Test sheet Edition Superceeded : IHC 7.6 R21 : 31.07.87

Calibrating oil : ISO-4113

Combination no. : 0 403 446 195

Injection pump

Pump designation : PES6MW100/320RS1112 : 0 413 406 108

EP type number

Governor Governor design. : RQV350...1200MW46-13 : 0 420 083 144 Governer no.

Customer-spec. information Customer : NAVISTAR

: DTA-466 Engine

1st version kW : 180.0 Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar : 2.80

Calibrating nozzle-holder

: 1 688 901 016 assembly

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

: 3.95...4.05 Prestroke mm HIGHEST RATED SPEED (3.90...4.10) 1st version Contr.-rod trav.mm: 9.00...12.00 Control-lever Cam sequence : 1- 5- 3- 6- 2- 4 position degrees: 43...48 Testing: 1st c-rod trav.mm : 11.40 Speed 1/min : 1240...1260 2nd c-rod trav.mm : 4.00 SD ang. spacing  $^{0}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{0}$ : 0.50 (0.75) 1/min : 1370...1380 4th speed 1/min: 1500 BASIC SETTING C-rod trav.mm : 0.00...1.00 1/mi: 800 1st speed LOWEST RATED SPEED I Contr.-rod trav.mm: 12.30...12.40 Control-lever position degrees: 9...17 Del.quantity cm3/: 11.7...11.9 Setting point w/out aux. spring 1/min : 350 100H.: (11.5...12.1) Contr.-rod trav.mm: 6.3 cm3/:0.3Dispersion Testing: Speed 1/min: 100 C-rod trav.mm min: 9.00 Speed 1/min: 350 100H.: (0.6) 1/min: 350.0 C-rod trav.mm : 6.30...6.40 2nd speed Contr.-rod trav. m: 6.3...6.4 Del.quantity cm3/: 1.6...2.0 100H.: (1.3...2.2) Dispersion cm3/: 0.3 100H.: (0.5) CONSTANT REGULATION 1/min : 360...450 Speed compensator (LDA, ADA, ALDA) (B) Setting of injection pump with externally-mounted governor 1st version Setting 1/min : 500 SLEEVE TRAVELS Speed 7 Pressure hPa : 190 Contr.-rod trav.mm: 11.00...11.10 1st speed 1/min: 1350 Sleeve travel mm: 8.30...8.50 2nd speed 1/min: 1460 Sleeve travel mm: 9.10...9.50 Measurement 3rd speed 1/min: 550 1/min : 500 Speed Sleeve travel mm: 3.10...3.70 4th speed 1/min: 350 1st pressure hPa : -C-rod trav.mm : 10.60...10.70 Sleeve travel mm: 1.30...1.70 2nd pressure hPa : 360 C-rod trav.mm : 11.70...12.00 SLEEVE POSITION Control-lever position 3rd pressure hPa : 800 : 12.30...12.40 C-rod trav.mm Degree: -1 17min: 1380 Speed Cont.-rod travelmm: 6.70...9.30 SWITCH-OVER POINT FULL-LOAD DELIV. AT FULL-LOAD STOP 1/min : 280 (290) Speed 1st version FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 800 1st version Charge press. hPa: 800 Speed 1/min: 1200 Del.quantity cm3/: 122.5...126.5 1000H.: (120.5...128.5)

G01

```
Dispersion
             cm3/:6.50
             1000H.: (7.00)
Charge press. hPa : -
Speed 1/min: 500
Del.quantity cm3/: 90.5...92.5
1000H.: (88.5...94.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.40
            1/min : 1240...1260
Speed
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 140.0...180.0
             1000H.: (137.0...183.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
             1/min : 350
Speed
Contr.-rod trav.mm: 6.30...6.40
Del.quantity cm3/ : 16.0...20.0
             1000H.: (13.5...22.5)
cm3/: 3.50
Dispersion
             1000H.: (5.50)
Remarks:
Perform pump setting only with IH hose
with restriction of 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.
In unlatched condition, do not
operate greater than n = 500 1/min
Set low idle at stop screw.
Set shutoff stop 1.5...2.0 mm before
shutoff.
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G02

Note inst. in remarks column

Test sheet Edition Superceeded : IHC 7,6 R23 : 10.08.87

Calibrating oil : ISO-4113

Combination no. : 0 403 446 196

Injection pump

Pump designation : PES6MW100/320RS1112

EP type number : 0 413 406 108

Governor

Governor design. : RQV350...1200MW46-14

Governer no. : 0 420 083 145

Customer-spec. information Customer : NAVISTAR

: DTA-466 Engine

1st version kW : 169.0 Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar : 2.80

Calibrating nozzle-holder

: 1 688 901 016 assembly

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 008

Outside Jiameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Prestroke mm : 3.954.05   (3.904.10)   Contrrod trav.mm: 9.0012.00   Cam sequence : 1-5-3-6-2-4	HIGHEST RATED SPEED 1st version Control-lever position degrees: 4449
SD ang. spacing CS: 0-60-120-180-240-300   Tolerance + - 0.50 (0.75)   BASIC SETTING	Testing: 1st c-rod trav.mm : 10.70 Speed 1/min : 12501270 2nd c-rod trav.mm : 4.00 Speed 1/min : 13651375 4th speed 1/min : 1460 C-rod trav.mm : 0.001.00
1st speed 1/mi: 800	LOWEST RATED SPEED I
Contrrod trav.ma: 11.7011.80	Control-lever position degrees: 1220
Del.quantity cm3/: 10.811.0	Setting point w/out aux. spring Speed 1/min: 350
100H.: (10.611.2)	Contrrod trav.mm: 6.2
Dispersion cm3/: 0.3 100H.: (0.6)	Testing: Speed 1/min: 100 C-rod trav.mm min: 9.00
2nd speed 1/min: 350.0 Contrrod trav. m: 6.26.3	Speed 1/min: 350 C-rod trav.mm: 6.26.3
Del.quantity cm3/: 1.62.0   100H.: (1.32.2)	CONSTANT REGULATION Speed 1/min: 360450
Dispersion cm3/: 0.3   1   1   1   1   1   1   1   1   1	compensator (LDA,ADA,ALDA)
(B) Setting of injection pump with externally-mounted governor	1st version Setting
SLEEVE TRAVELS  1 st speed 1/min: 1350   Sleeve travel mm: 8.308.50   2nd speed 1/min: 1460	Speed 1/min: 500 Pressure hPa: 180 Contrrod trav.mm: 11.0011.10
Sleeve travel mm: 9.109.50	Measurement Speed 1/min: 500
4th speed 1/min: 350   Sleeve travel mm: 1.301.70   SLEEVE POSITION	1st pressure hPa : - C-rod trav.mm : 10.7010.80 2nd pressure hPa : 270 C-rod trav.mm : 11.3011.40
Control-lever position Degree: -1	3rd pressure hPa : 800 C-rod trav.mm : 11.7011.80
Speed 17min: 1380   Controd travelmm: 6.709.30	SWITCH-OVER POINT
FULL-LOAD DELIV. AT FULL-LOAD STOP	Speed 1/min : 280 (290)
1st version ! Speed 1/min: 800 ! Charge press. hPa : 800	FUEL-DELIVERY CHARACTERISTICS
Del.quantity cm3/: 108.0110.0 i 1000H.: (106.0112.0)	1st version Charge press. hPa : 800
Dispersion cm3/: 3.50   1   1000H.: (6.00)	Speed 1/min: 1200 Del.quantity cm3/: 112.5116.5 1000H.: (110.5118.5)
604	

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Dispersion
                 cm3/:6.50
                1000H.: (7.00)
Charge press. hPa : -
                1/min : 500
Speed
Del.quantity cm3/: 87.0...89.0
                1000H.: (85.0...91.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.70
Speed
                1/min : 1250...1270
STARTING FUEL DELIVERY
Speed
                1/min : 100
Del.quantity cm3/: 140.0...180.0
1000H.: (137.0...183.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
Speed
                1/min : 350
Contr.-rod trav.mm: 6.20...6.30
Del.quantity cm3/: 16.0...20.0
1000H:: (13.5...22.5)
Dispersion cm3/: 3.50
1000H:: (5.50)
Remarks:
Perform pump setting only with IH hose with restriction of 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.
In unlatched condition, do not operate greater than n = 500 1/min
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Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before shutoff.

Note inst. in remarks column

Test sheet Edition : IHC 7,6 R24 : 10.08.87

Superceeded

Calibrating oil : ISO-4113

: 0 403 446 197 Combination no.

Injection pump

Pump designation : PES6MW100/320RS1112

EP type number : 0 413 406 108

Governor

Governor design. : RQV350...1200MW46-15 Governer no. : 0 420 083 146

Customer-spec. information Customer : NAVISTAR

Engine : DTA-466

1st version kW : 158.0 1/min: 2400 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar : 2.80

Calibrating nozzle-holder

assembly : 1 688 901 016

Opening

pressure, bar : 207...210

Perforated-plate

: 0.5 diameter mm

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Prestroke mm : 3.954.05   (3.904.10)   Contrrod trav.mm: 9.0012.00   Cam sequence : 1-5-3-6-2-4	HIGHEST RATED SPEED 1st version Control-lever position degrees: 4348
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)  BASIC SETTING	Testing: 1st c-rod trav.mm: 10.00 Speed 1/min: 12501270 2nd c-rod trav.mm: 4.00 Speed 1/min: 13551365 4th speed 1/min: 1500 C-rod trav.mm: 0.001.00
1st speed	LOWEST RATED SPEED I
Contrrod trav.mm: 11.0011.10	Control-lever position degrees: 1018
Del.quantity cm3/ : 9.910.1	Setting point w/out aux. spring Speed 1/min: 350
100H.: (9.710.3)	Contrrod trav.mm: 6.2
Dispersion cm3/: 0.3	Testing:
100H.: (0.6)	Speed 1/min: 100 C-rod trav.mm min: 9.00 Speed 1/min: 350
2nd speed	C-rod trav.mm : 6.206.30  CONSTANT REGULATION Speed 1/min : 360450  compensator (LDA,ADA,ALDA)
(B) Setting of injection pump with externally-mounted governor	1st version
SLEEVE TRAVELS  1st speed  1/min: 1350    Steeve travel mm: 8.308.50  2nd speed  1/min: 1460    Steeve travel mm: 9.109.50  3rd speed  1/min: 550    Steeve travel mm: 3.103.70  4th speed  1/min: 350    Steeve travel mm: 1.301.70	Setting Speed 1/min: 500 Pressure hPa: 200 Contrrod tray.mm: 10.7010.80  Measurement Speed 1/min: 500  1st pressure hPa: - C-rod tray.mm: 10.4010.50
SLEEVE POSITION	3rd pressure hPa : 800 C-rod trav.mm : 11.0011.10
Control-lever position  Degree: -1  Speed 1/min: 1380  Controd travelmm: 6.709.30	SWITCH-OVER POINT Speed 1/min : 280 (290)
FULL-LOAD DELIV. AT FULL-LOAD STOP	FUEL-DELIVERY CHARACTERISTICS
1st version  Speed 1/min: 800  Charge press. hPa: 800  Del.quantity cm3/: 99.0101.0  1000H.: (97.0103.0)  Dispersion cm3/: 3.50  1000H.: (6.00)	1st version Charge press. hPa: 800 Speed 1/min: 1200 Del.quantity cm3/: 102.5106.5 1000H.: (100.5108.5) Dispersion cm3/: 6.50 1000H.: (7.00)
607	

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Charge press, hPa : -
Speed 1/min: 500
Del.quantity cm3/: 84.0...86.0
1000H.: (82.0...88.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.00
              1/min: 1250...1270
Speed
STARTING FUEL DELIVERY
               1/min : 100
Speed
Del.quantity cm3/: 140.0...180.0
1000H.: (137.0...183.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
               1/min : 350
Speed
Contr.-rod trav.mm: 6.20...6.30
Del.quantity cm3/: 16.0...20.0
1000H.: (13.5...22.5)
Dispersion cm3/: 3.50
1000H.: (5.50)
Remarks:
Perform pump setting only with IH hose
with restriction of 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.
In unlatched condition, do not
operate greater than n = 500 1/min
Set low idle at stop screw.
Set shutoff stop 1.5...2.0 mm before
shutoff.
G08
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BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet Edition Superceeded : IHC 7,6 T : 10.08.87 Calibrating oil : ISO-4113 Combination no. : 0 403 446 198 Injection pump Pump designation : PES6MW100/320RS1160 EP type number : 0 413 406 147 Governor Governor design. Governer no. : RQV350...1200MW46-16 : 0 420 083 147 Customer-spec. information Customer : NAVISTAR : DTA-466 Engine 1st version kW : 176.4 1/min: 2400 Speed TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 037 Inlet press., bar : 2.80 Calibrating nozzle-holder : 1 688 901 016 assembly Opening pressure, bar : 207...210 Perforated-plate : 0.5 diameter mm Test inj. tubing : 1 680 750 008 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_\_

START OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.954.05 : (3.904.10) : (5.904.10) : (5.9012.00 : (	HIGHEST RATED SPEED 1st version Control-lever position degrees: 4449
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)  BASIC SETTING	Testing: 1st c-rod trav.mm : 11.60 Speed 1/min : 12601280 2nd c-rod trav.mm : 4.00 Speed 1/min : 13851395 4th speed 1/min : 1500 C-rod trav.mm : 0.001.00
1st speed 1/mi: 800	LOWEST RATED SPEED I
Contrrod trav.mm: 12.6012.70  Del.quantity cm3/: 12.212.4	Control-lever position degrees: 1220 Setting point w/out aux. spring Speed 1/min : 350
100H.: (12.012.6)	Contrrod trav.mm: 6.5
100H.: (0.6) 2nd speed 1/min: 350.0	Testing: Speed 1/min: 100 C-rod trav.mm min: 9.00 Speed 1/min: 350 C-rod trav.mm : 6.506.60
Contrrod trav. m: 6.56.6   Del.quantity cm3/: 1.62.0   100H.: (1.32.2)   Dispersion cm3/: 0.3   100H.: (0.5)	CONSTANT REGULATION Speed 1/min: 300450 compensator (LDA,ADA,ALDA)
(B) Setting of injection pump with externally-mounted governor	1st version Setting
SLEEVE TRAVELS  1st speed 1/min: 1350  Sleeve travel mm: 8.308.50  2nd speed 1/min: 1460  Sleeve travel mm: 9.109.50	Speed 1/min: 800 Pressure hPa: 180 Contrrod trav.mm: 10.6010.70 Measurement
3rd speed 1/min: 550 Sleeve travel mm: 3.103.70 4th speed 1/min: 350 Sleeve travel mm: 1.301.70	Speed 1/min: 800  1st pressure hPa: -    C-rod trav.mm: 10.3010.40 2nd pressure hPa: 480
SLEEVE POSITION Control-lever position Degree: ~1 Speed 1/min: 1380	C-rod trav.mm : 12.1012.49 3rd pressure hPa : 800 C-rod trav.mm : 12.6012.70
Controd travelmm: 6.609.40	SWITCH-OVER POINT
FULL-LOAD DELIV. AT FULL-LOAD STOP	Speed 1/min : 280 (290)
1st version Speed 1/min: 800 Charge press. hPa: 800 Del.quantity cm3/: 122.0124.0	FUEL-DELIVERY CHARACTERISTICS  1st version
1000H.: (120.0126.0)	Charge press. hPa : 800 Speed 1/min : 1300 Del.quantity cm3/ : 126.0130.0 1000H.: (124.0132.0)
G10	

```
cm3/:6.50
Dispersion
              1000H.: (7.00)
Charge press. hPa : -
Speed
              1/min: 800
Del.quantity cm3/: 83.5...85.5
              1000H.: (81.5...87.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.60
Speed
             1/min : 1260...1280
STARTING FUEL DELIVERY
Speed
             1/min : 100
Del.quantity cm3/: 140.0...180.0
              1000H.: (137.0...183.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
             1/min : 350
Speed
Contr.-rod trav.mm: 6.50...6.60
Del.quantity cm3/: 16.0...20.0
1000H:: (13.5...22.5)
Dispersion cm3/: 3.50
             1000H.: (5.50)
Remarks:
Perform pump setting only with IH hose with restriction of 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.
In unlatched condition, do not
operate greater than n = 500 1/min
Set low idle at stop screw.
Set shutoff stop 1.5...2.0 mm before
shutoff,
G11
```

Note inst. in remarks column

Test sheet Edition Superceeded : IHC 7.6 T 1 : 10.08.87

Calibrating oil : ISO-4113

Combination no. : 0 403 446 199

Injection pump

Pump designation : PES6MW100/320RS1160

EP type number : 0 413 406 147

Governor

Governor design. : RQV350...1200MW46-17 Governer no. : 0 420 083 148

Customer-spec. information Customer : NAVISTAR

Engine : DTA-466

1st version kW : 154.5 Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 2 417 413 037

Inlet press., bar : 2.80

Calibrating nozzle-holder

assembly : 1 688 901 016

Opening |

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness : 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY Test pressure, bar: 30...32

HIGHEST RATED SPEED Prestroke mm : 3.95...4.05 : (3.90...4.10) 1st version Contr.-rod trav.mm: 9.00...12.00 Control-lever Cam sequence : 1-5-3-6-2-4 position degrees: 44...49 Testing: 1st c-rod trav.mm: 10.50 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Speed 1/min: 1260...1280 2nd c-rod trav.mm : 4.00 Speed 1/min : 1375...1385 4th speed 1/min : 1500 BASIC SETTING C-rod trav.mm : 0.00...1.00 1st speed 1/mi: 800 LOWEST RATED SPEED I Contr.~rod trav.mm: 11.50...11.60 Control-lever position degrees: 10...18
Setting point w/out aux. spring
Speed 1/min: 350 Del.quantity cm3/: 10.4...10.6 100H.: (10.2...10.8) Contr.-rod trav.mm: 6.3 cm3/: 0.3 Dispersion Testing: Speed 1/min : 100 C-rod trav.mm min : 9.00 100H.: (0.6) Speed 1/min: 350 1/min: 350.0 C-rod tray.mm : 6.30...6.40 2nd speed Contr.-rod trav. m: 6.3...6.4

Del.quantity cm3/: 1.6...2.0

100H.: (1.3...2.2)

Dispersion cm3/: 0.3

100H.: (0.5) CONSTANT REGULATION 1/min : 300...450 Speed compensator (LDA, ADA, ALDA) (B) Setting of injection pump with externally-mounted governor 1st version Setting 1/min : 500 hPa : 190 SLEEVE TRAVELS Speed 1st speed 1/min: 1350 Sleeve travel mm: 8.30...8.50 Pressure Contra-rod tray.mm: 10.60...10.70 2nd speed 1/min: 1460 Sleeve travel mm: 9.10...9.50 Measurement 3rd speed 1/min: 550 Speed 1/min : 500 Sleeve travel mm: 3.10...3.70 4th speed 1/min: 350 1st pressure hPa : -Sleeve travel mm: 1.30...1.70 C-rod trav.mm : 10.20...10.30 2nd pressure hPa : 290 C-rod trav.mm : 11.10...11.20 3rd pressure hPa : 800 SLEEVE POSITION Control-lever position Degree: -1 1/min: 1380 : 11.00...11.10 C-rod trav.mm Cont.-rod travelmm: 6.60...9.40 SWITCH-OVER POINT FULL-LOAD DELIV. AT FULL-LOAD STOP Speed 1/min: 220 (210) FUEL-DELIVERY CHARACTERISTICS 1st version Speed 1/min: 800 Charge press. hPa: 800 Del.quantity cm3/: 104.0...106.0 1000H.: (102.0...108.0) 1st version Charge press. hPa : 800 Dispersion @m3/ : 3.50 Speed 1/min: 1200 Del.quantity cm3/: 107.0...111.0 1000H.: (6,00) 1000H.: (105.0...113.0) G13

```
cm3/:6.50
Dispersion
              1000H.: (7.00)
Charge press. hPa : -
              1/min : 500
Speed
Del.quantity cm3/: 75.5...77.5
1000H.: (73.5...79.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.50
             1/min: 1260...1280
Speed
STARTING FUEL DELIVERY
              1/min : 100
Speed
Del.quantity cm3/: 140.0...180.0
1000H.: (137.0...183.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
              1/min : 350
Speed
Contr.-rod trav.mm: 6.30...6.40
Del.quantity cm3/: 16.0...20.0
1000H.: (13.5...22.5)
Dispersion cm3/: 3.50
              1000H.: (5.50)
Remarks:
Perform pump setting only with IH hose with restriction of 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.
In unlatched condition, do not
operate greater than n = 500 1/min
Set low idle at stop screw.
Set shutoff stop 1.5...2.0 mm before
shutoff.
G14
```

Note inst. in remarks column

Test sheet Edition : PER 8,8 F 1 : 09.03.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 403 448 125

Injection pump

Pump designation : PES8MW100/720RS1113

EP type number : 0 413 408 010

Governor

Governor design. : RQV250...900MW37-5

Governer no. : 0 420 083 100

Customer-spec. information Customer : PERKINS

: TV8.540M Engine

1st version kW : 160.0 Speed 1/min: 1800

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 173...176

Test inj. tubing : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

: 3.00...3.10 Prestroke mm

: (2.95...3.15)

Contr.-rod trav.mm: 9.00...12.00

```
Cam sequence : 1-8-7-5-4-3-
                                                          Control-lever
                          6- 2
                                                           position degrees: 60...68
                                                          Testing:
                                                          1st c-rod trav.mm : 12.20
SD ang. spacing<sup>0</sup>CS: 0-45-90-135-180-225-
                                                            Speed 1/min: 940...950
                        270-315
                                                          2nd c-rod trav.mm: 4.00
                                                            Speed 1/min: 1010...1040
th speed 1/min: 1200
C-rod trav.mm: 0.00...1.00
Tolerance + - 0
                     : 0.50 (0.75)
                                                          4th speed
BASIC SETTING
             1/mi: 900
                                                          LOWEST RATED SPEED I
1st speed
                                                          Control-lever
Contr.-rod trav.mm: 13.20...13.30
                                                          position degrees: 12...20
                                                          Setting point w/out aux. spring
Del.quantity cm3/ : 9.9...10.1
                                                                       1/min : 250
                                                          Contr.-rod trav.mm: 7.4
               100H.: (9.7...10.3)
                                                          Testing:
                                                          Speed 1/min: 100
C-rod trav.mm min: 9.00
Dispersion
               cm3/:0.3
                                                          Speed 1/min : 250
               100H.: (0.6)
                                                          C-rod trav.mm : 7.40...7.50
               1/min: 250.0
2nd speed
Contr.-rod trav. m: 7.4...7.5
                                                          CONSTANT REGULATION
Del.quantity cm3/: 0.9...1.3
100H.: (0.7...1.6)
Dispersion cm3/: 0.3
100H.: (0.5)
                                                                       1/min : 270...500
                                                          Speed
                                                          SWITCH-OVER POINT
                                                                        1/min: 170 (200)
                                                          Speed
(B) Setting of injection pump with
                                                          FUEL-DELIVERY CHARACTERISTICS
     externally-mounted governor
                                                                        1/min : 600
                                                          Speed
                                                          Del.quantity cm3/: 93.5...97.5
SLEEVE TRAVELS
1st speed 1/min: 950
Sleeve travel mm: 8.20...8.30
2nd speed 1/min: 1020
Sleeve travel mm: 9.20...9.40
                                                                        1000H.: (91.5...99.5)
cm3/: 5.00
1000H.: (7.00)
                                                          Dispersion
3rd speed 1/min: 600
                                                          ROTATIONAL-SPEED LIMITATION
  Sleeve travel mm: 4.40...5.00
4th speed 1/min: 250
                                                          1st version
  Sleeve travel mm: 0.60...1.00
                                                          1mm control-rod travel less than
                                                           full-load trav.mm: 12.20
SLEEVE POSITION
                                                                       1/min: 940...950
Control-lever position
                                                          Speed
              Degree: -1
               17min: 965
                                                          STARTING FUEL DELIVERY
Speed
Cont.-rod travelmm: 15.20...17.80
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                                        1/min : 100
                                                          Del.quantity cm3/: 90.0...100.0
                                                                        1000H.: (87.0...103.0)
1st version
Speed 1/min: 900
Del.quantity cm3/: 99.5...101.5
1000H.: (97.5...103.5)
Dispersion cm3/: 3.50
                                                          LOW IDLE
                                                         Speed 1/min: 250
Contr.-rod trav.mm: 7.40...7.50
Del.quantity cm3/: 9.5...13.5
              1000H.: (6.00)
                                                                        1000H.: (7.0...16.0)
HIGHEST RATED SPEED
1st version
```

Dispersion cm3/: 3.50 1000H.: (5.50)

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                            : 3.50...3.60
                                                       Prestroke mm
                                                                            : (3.45...3.65)
Note inst. in remarks column
                                                       Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1-5- 3- 6- 2- 4
                    : CUM 8,3 C 2 : 21.8.87
Test sheet
Edition
Superceeded
                    : ISO-4113
Calibrating oil
                                                       SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Combination no.
                     : 0 403 466 103
Injection pump
                                                        SD mark cyl. no. : 1
Pump designation : PES6MW100/120RS1137
EP type number
                    : 0 413 406 131
                                                       BASIC SETTING
Governor
                   : RSV375...1100MW2A319
                                                                       1/mi: 1100
Governor design.
                                                        1st speed
                       -2
                                                        Contr.-rod trav.mm: 14.10...14.20
Governer no.
                    : 0 420 085 062
                                                       Del.quantity cm3/: 14.2...14.4
Customer-spec. information
Customer
                    : CDC-USA
                                                                      100H.: (14.0...14.6)
Engine
                    : 6 CTA-8.3 L
                                                       Dispersion
                                                                      cm3/: 0.35
1st version kW : 188.0
Speed
               1/min: 2200
                                                                      100H.: (0.6)
                                                       2nd speed 1/min: 425.0
Contr.-rod trav. m: 7.8...7.9
Del.quantity cm3/: 1.9...2.3
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                    : 38...42
                                                                      100H.: (1.6...2.5)
                                                                      cm3/: 0.35
                                                       Dispersion
                                                                      100H.: (0.5)
Overflow valve
                     : 1 417 413 047
                                                       SLEEVE POSITION
                                                       Control-lever position
Inlet press., bar : 1.50
                                                                     Degree: -3
                                                                      17min: 800
Calibrating nozzle-holder
                                                       Speed
                                                       Cont.-rod travelmm: 0.30...1.00
 assembly
                   : 1 688 901 017
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
                    : 205...208
 pressure, bar
                                                       1st version
                                                       Speed 1/min: 1100
Del.quantity cm3/: 142.0...144.0
1000H.: (140.0...146.0)
Dispersion cm3/: 3.50
Perforated-plate
diameter mm
                    : 0,6
                                                                     1000H.: (6.00)
Test inj. tubing : 1 680 750 008
Outside diameter
                                                       HIGHEST RATED SPEED
x Wall thickness
                                                       1st version
                    : 6.00X2.00X600
                                                       Control-lever
x Length mm
                                                        position degrees: 42...50
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                       Testing:
                                                       1st c-rod trav.mm: 13.10
                                                                    1/min : 1140...1150
    per values ____
                                                          Speed
                                                       2nd c-rod trav.mm : 4.00
                                                                    1/min: 1215...1245
START OF DELIVERY
                                                          Speed
                                                       3rd c-rod trav.mm: 0.30...1.70
Test pressure, bar: 30...32
```

G18

```
Speed
             1/min : 1300
LOWEST RATED SPEED I
Control-lever
 position degrees: 18...26
Setting point w/out aux. spring
Speed 1/min: 425
Contr.-rod trav.mm: 7.85
Testing:
Speed
             1/min : 100
C-rod trav.mm min : 19.00
Speed
            1/min : 425
                 7.8...7.9
C-rod trav.mm
TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min: 1100
C-rod trav.mm : 14.10...14.20
2nd speed 1/min : 750
  C-rod tray.mm : 14.80...14.90
FUEL-DELIVERY CHARACTERISTICS
Speed
             1/min : 750
Del.quantity cm3/: 148.5...150.5
1000H.: (146.5...152.5)
Dispersion cm3/: 5.00
             1000H.: (7.00)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 13.10
Speed
            1/min : 1140...1150
STARTING FUEL DELIVERY
Speed
            1/min : 100
Del.quantity cm3/: 125.0...145.0
             1000H.: (122.0...148.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
Del.quantity cm3/: 19.0...23.0
            1000H.: (16.5...25.5)
cm3/: 3.50
Dispersion
            1000H.: (5.50)
Remarks:
Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1
Starting/full-load transition speed
from holding magnet = 500 1/min.
```

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : CUM 8.3 C3 : 21.8.87 Edition Superceeded Calibrating oil : ISO-4113 : 0 403 466 104 Combination no. Injection pump : PES6MW100/120RS1137 Pump designation : 0 413 406 131 EP type number Governor : RSV400...1050MW2A319 Governor design. -3 : 0 420 085 074 Governer no. Customer-spec. information Customer : CUMMINS/US : 6 CTA-8,3 L Engine 1st version kW : 165.0 1/min: 2100 Speed TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar : 1.50 Calibrating nozzle-holer assembly : 1 688 910 017 Opening pressure, bar : 207...210 Perforated-plate diameter mm : 0,6 Test inj. tubing : 1 680 750 008 Outside diameter x Wall thickness : 6,00x2,00x600 x Length mm (A) Injection pump setting values

Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Date of mfg. : 30...32

```
C-rod trav.mm
                                                                                  : 0,30...1,70
                      : 3,50...3,60
: (3,45...3,65)
Prestroke mm
                                                            LOWEST RATED SPEED I
Contr.-rod trav.mm: 9,00...12,00
                                                            Control-lever
                      : 1-5-3-6-2-4
Cam sequence
                                                             position degrees: 19...27
                                                            Setting point w/out aux. spring
                                                                          1/min : 400
                                                            Contr.-rod trav.mm: 6.95
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                                                            Testing:
                                                            Speed 1/min: 100
C-rod trav.mm min: 19,00
SD mark cyl. no. : 1
                                                                          1/min : 400
BASIC SETTING
                                                            C-rod trav.mm
                                                                                : 6,90...7,00
1st speed
                 1/mi: 1050
                                                            SET IDLE AUXILIARY SPRING
                                                            Contr.-rod trav.mm: 4,00
Contr.-rod trav.mm: 12,10...12,20
                                                            TORQUE CONTROL
                                                            Torque-control curve ~ 1st version 1st speed 1/min : 1050
Del.quantity cm3/ : 12,4...12,6
                                                                               20,...12,20
                100H.: (12,2...12,8)
                                                              C-rod trav.mm
                                                                         1/min : 750
                                                            2nd speed
                                                              C-rod travamm : 14,20...14,30
Dispersion
                cm3/:0.35
                                                            FUEL-DELIVERY CHARACTERISTICS
                100H.: (0,60)
                                                           Speed 1/min: 750

Del.quantity cm3/: 151.0...153.0

1000H.: (149.0...155.0)

Dispersion cm3/: 5.00

1000H.: (7.00)
2nd speed 1/min: 400
Contr.-rod trav. m: 6,90...7,00
Del.quantity cm3/: 1,6...2,0
100H.: (1,3...2,2)
                1/min: 400
2nd speed
                cm3/: 0.35
Dispersion
                100H.: (0.50)
                                                            ROTATIONAL-SPEED LIMITATION
SLEEVE POSITION
                                                            1st version
Control-lever position
                                                            1mm control-rod travel less than
               Degree: -3
                17min: 800
                                                             full-load trav.mm: 11,10
Speed
                                                                          1/min : 1090...1100
Cont.-rod travelmm: 0.30...1.00
                                                            Speed
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                            STARTING FUEL DELIVERY
1st version
Speed 1/min: 1050
Del.quantity cm3/: 124,0...126,0
                                                           Speed 1/min: 100
Del.quantity cm3/: 125,0...145,0
1000H.: (122,0...148,0)
              1000H.: (122,0...128,0) cm3/: 3,5
                                                            Contr.-rod trav.mm: 19,00...21,00
Dispersion
              1000H.: (6.0)
                                                           LOW IDLE
HIGHEST RATED SPEED
                                                                          1/min : 400
1st version
                                                            Speed
                                                            Contr.-rod trav.mm: 6,90...7,00
Control-lever
                                                           Del.quantity cm3/: 16.0...20.0
1000H.: (13.5...22.5)
Dispersion cm3/: 3.50
 position degrees: 40...48
Testing:
                                                                          1000H.: (5,50)
1st c-rod trav.mm : 11,10
             1/min : 1090...1100
  Speed
2nd c-rod trav.mm : 4.00
Speed 1/min : 1150...1180
                                                           Remarks:
                                                            Start-of-delivery mark at 10° cam
              1/min : 1250
                                                           rotation angle after start of delivery,
4th speed
G21
```

cylinder 1 Starting/full-load transition speed from holding magnet = 500 1/min. G22

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                           Prestroke mm : 3,50...3,60 : (3,45...3,65)
Contr.-rod trav.mm: 9,00...12,00
Note inst. in remarks column
                      : CUM 8.3 C4
: 21.8.87
                                                            Cam sequence : 1-5-3-6-2-4
Test sheet
Edition
Superceeded
Calibrating oil
                     : ISO-4113
                                                           SD ang. spacing ^{0}CS: 0-60-120-180-240-300 Tolerance + - ^{0}: 0.50 (0.75)
                      : 0 403 466 105
Combination no.
Injection pump
                                                            SD mark cyl. no. : 1
Pump designation : PES6MW100/120RS1137
EP type number
                      : 0 413 406 131
                                                            BASIC SETTING
Governor
Governor design.
                      : R$V400...1100MW2A319
                                                            1st speed
                                                                            1/mi: 1100
                      : 0 420 085 080
                                                            Contr.-rod trav.mm: 12,60...12,70
Governer no.
Customer-spec. information
                                                            Del.quantity cm3/ : 13,2...13,4
Customer
                     : CUMMINS/US
                                                                           100H.: (13,0...13,6)
Engine
                      : 6 CTA-8,3 L
                                                            Dispersion
                                                                           cm3/:0,30
1st version kW : 171.5
                1/min: 2200
                                                                           100H.: (0,60)
Speed
TEST BENCH REQUIREMENTS
                                                                           1/min: 400
                                                            2nd speed
                                                           Contr.-rod trav. m: 7,00...7,10
Del.quantity cm3/: 1,6...2,0
100H.: (1,3...2.2)
Dispersion cm3/: 0,30
100H.: (0,50)
Calibrating-oil inlet temp. °C
                      : 38...42
Overflow valve
                      : 1 417 413 047
                                                            SLEEVE POSITION
Inlet press., bar : 1.50
                                                            Control-lever position
                                                                          Degree: -3
                                                                           17min: 800
Calibrating nozzle-holder
                                                           Speed
                   : 1 688 901 017
                                                           Cont.-rod travelmm: 0.30...1.00
 assembly
                                                           FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
                      : 207...210
 pressure, bar
                                                           1st version
Perforated-plate
                                                                           1/min: 1100
                                                           Speed
                                                           Del.quantity cm3/: 132,5...134,5
1000H:: (130,5...136,5)
Dispersion cm3/: 3,50
 diameter mm
                      : 0,6
Test inj. tubing : 1 680 750 008
                                                                          1000H.: (6,00)
Outside diameter
                                                           HIGHEST RATED SPEED
x Wall thickness
                                                           1st version
                    : 6,00x2,00x600
x Length mm
                                                           Control-lever
                                                            position degrees: 40...48
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                           Testing:
                                                           1st c-rod trav.mm : 11,60
Speed 1/min : 1140...1150
2nd c-rod trav.mm : 4,00
Speed 1/min : 1200...1230
    per values
START OF DELIVERY
                                                                          1/min : 1300
Test pressure, bar: 30...32
                                                           4th speed
G23
```

```
: 0.30...1.70
  C-rod trav.mm
LOWEST RATED SPEED I
Control-lever
 position degrees: 16...24
Setting point w/out aux. spring
Speed
             1/min : 400
Contr.-rod trav.mm: 7.05
Testing:
Speed
               1/min : 100
C-rod trav.mm min: 19.00
Speed
              1/min : 400
C-rod trav.mm
                     : 7,00...7,10
SET IDLE AUXILIARY SPRING
Contr.-rcd trav.mm: 4.00
TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min : 1100
C-rod trav.mm : 12,60...12,70 = 2nd speed 1/min : 750
                     : 13,70...13,80
  C-rod trav.mm
FUEL-DELIVERY CHARACTERISTICS
Speed
              1/\min : 750
Del.quantity cm3/: 141.0...143.0
1000H.: (139.0...145.0)
Dispersion cm3/: 5.00
1000H.: (7.00)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11,60
Speed
              1/min : 1140...1150
STARTING FUEL DELIVERY
Speed
              1/min : 100
Del.quantity cm3/: 125.0...145.0
1000H.: (122.0...148.0)
Contr.-rod trav.mm: 19,00...21,00
LOW IDLE
Speed 1/min: 400
Contr.-rod trav.mm: 7,00...7,10
Del.quantity cm3/: 16,0...20,0
1000H.: (13,5...22,5)
Dispersion cm3/: 3,50
1000H.: (5,50)
Remarks:
Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
```

G24

cylinder 1 Starting/full-load transition speed from holding magnet = 500 1/min.

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                         : 3.60...3.70
: (3.55...3.75)
                                                      Prestroke mm
Note inst. in remarks column
                                                      Contr.-rod trav.mm: 9.00...12.00
                    : CUM 8,3 E
                                                                         : 1-5-3-6-2-4
Test sheet
                                                      Cam sequence
                    : 26.06.87
Edition
Superceeded
                    : ISO-4113
Calibrating oil
                                                      SD ang. spacing ^{\circ}CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Combination no.
                    : 0 403 466 107
Injection pump
                                                      SD mark cyl. no. : 1
Pump designation
                    : PES6MW100/120RS1148
EP type number
                    : 0 413 406 143
                                                      BASIC SETTING
Governor
                                                      1st speed
Governor design.
                    : RSV400...900MW7A319-
                                                                     1/mi: 900
                    : 0 420 085 082
                                                      Contr.-rod trav.mm: 13.00...13.10
Governer no.
                                                      Del.quantity cm3/: 18.3...18.5
Customer-spec. information
Customer
                    : CUMMINS/US
                                                                    100H.: (18.1...18.7)
                    : 6 CTA-8.3 L
Engine
                                                      Dispersion
                                                                    cm3/:0.3
1st version kW : 196.9
Speed
              1/min: 1800
                                                                    100H.: (0.6)
                                                                    1/min: 400.0
TEST BENCH REQUIREMENTS
                                                      2nd speed
                                                     Contr.-rod trav. m: 5.9...6.0
                                                     Del.quantity cm3/: 1.6...2.0
100H: (1.3...2.2)
Dispersion cm3/: 0.3
100H:: (0.5)
Calibrating-oil inlet temp. OC
                    : 38...42
Overflow valve
                    : 1 417 413 047
                                                     SLEEVE POSITION
                                                     Control-lever position
Inlet press., bar : 1.50
                                                                   Degree: -3
                                                                    17min: 800
Calibrating nozzle-holder
 assembly
                   : 1 688 901 017
                                                     Cont.-rod travelmm: 0.30...1.00
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Vaening
 pressure, bar
                    : 207...210
                                                     1st version
Per#orated-plate
                                                                    1/min: 900
                                                     Speed
 diameter mm
                    : 0.6
                                                     Del.quantity cm3/: 183.0...185.0
                                                                  1000H.: (181.5...187.5)
cm3/: 3.50
1000H.: (6.00)
                                                     Dispersion
Test inj. tubing : 1 680 750 008
Outside diameter
                                                     HIGHEST RATED SPEED
x Wall thickness
                                                     1st version
x Length mm
                    : 6.00x2.00x600
                                                     Control-lever
                                                      position degrees: 47...55
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                     Testing:
                                                     1st c-rod tray.mm : 12.00
    per values
                                                                  1/min: 940...950
                                                        Speed
                                                     2nd c-rod trav.mm : 4.00
                                                                 1/min: 965...990
START OF DELIVERY
                                                        Speed
                                                                  1/min : 1000
Test pressure, bar: 30...32
                                                     4th speed
```

```
: 0.30...1.70
  C-rod trav.mm
LOWEST RATED SPEED I
Control-lever
 position degrees: 18...26
Setting point w/out aux. spring
              1/min : 400
Speed
Contr.-rod trav.mm: 5.9
Testing:
Speed
              1/min : 100
C-rod trav.mm min : 19.00
          1/min : 400
Speed
                     : 5.90...6.00
C-rod trav.mm
FUEL-DELIVERY CHARACTERISTICS
Speed
              1/min : 750
Del.quantity cm3/: 179.0...183.0
1000H.: (177.0...185.0)
Dispersion cm3/: 5.00
              1000H.: (7.00)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 12.00
Speed
             1/min : 940...950
STARTING FUEL DELIVERY
              1/min : 100
Speed
Del.quantity cm3/: 125.0...145.0
              1000H.: (122.0...148.0)
Contr.-rod trav.mm: 19,00...21.00
LOW IDLE
Speed 1/min: 400
Contr.-rod trav.mm: 5.90...6.00
Del.quantity cm3/: 16.0...20.0
1000H.: (13.5...22.5)
Dispersion cm3/: 3.50
              1000H.: (5.50)
Remarks:
Start-of-delivery mark 90 cam angle
after start of delivery cyl. 1.
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Cam sequence : 1- 3- 4- 2
Note inst. in remarks column
                                                      SD ang. spacing ^{0}CS: 0-90-180-270 Tolerance + - ^{+} : 0.50 (0.75)
Test sheet
                    : MB 4,0 A 18
                    : 25.08.87
Edition
Superceeded
Calibrating oil : ISO-4113
                                                      BASIC SETTING
                   : 0 403 474 002
Combination no.
                                                                      1/mi: 1200
                                                      1st speed
                                                      Contr.-rod trav.mm: 11.70...11.80
Injection pump
Pump designation : PES4MW100/720RS1127
EP type number : 0 413 404 103
                                                      Del.quantity cm3/ : 7.8...8.0
Governor
Governor design.
Governer no.
                    : RSV350...1200MW0A322
                                                                     100H.: (7.6...8.2)
                    : 0 420 085 075
                                                      Dispersion
                                                                     cm3/:0.3
Customer-spec. information
                                                                     100H.: (0.6)
Customer
                   : DB
Engine
                   : 0M 364 A
                                                                     1/min: 350
                                                      2nd speed
                                                      Contr.-rod trav. m: 6.8...7.4
                                                      Del.quantity cm3/: 0.8...1.0
100H:: (0.6...1.4)
Dispersion cm3/: 0.3
100H:: (0.5)
1st version kW : 66.0
Speed
              1/min: 2400
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                      SLEEVE POSITION
                   : 38...42
                                                      Control-lever position
                                                                   Degree: -3
1/min: 800
Overflow valve
                                                      Speed
                    : 1 417 413 047
                                                      Cont.-rod travelmm: 0.30...1.00
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Inlet press., bar : 1.50
Calibrating nozzle-holder
                                                      1st version
                                                      Speed 1/min: 1200
Del.quantity cm3/: 78.0..80.0
1000H.: (76.0...82.0)
Dispersion cm3/: 3.50
              : 0 681 343 009
 assembly
Opening
pressure, bar : 172...175
                                                                    1000H.: (6.00)
Test inj. tubing : 1 680 750 008
                                                      HIGHEST RATED SPEED
                                                      1st version
Outside diameter
                                                      Control-lever
x Wall thickness
                                                       position degrees: 52...60
x Length mm : 6.00x2.00x600
                                                      Testing:
                                                      1st c-rod trav.mm : 10.70
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                        Speed 1/min: 1240...1245
                                                      2nd c-rod trav.mm : 4.00
                                                      Speed 1/min: 1322...1335
3rd c-rod trav.mm: 4.00
    per values
                                                       Speed 1/min : 1,345....1.375
START OF DELIVERY
                                                      4th speed 1/min: 1450
Test pressure, bar: 30...32
                                                        C-rod trav.mm : 0.30...1.70
Prestroke mm
                    : 3.70...3.80
                    : (3.65...3.85)
                                                      LOWEST RATED SPEED I
Contr.-rod trav.mm: 9.00...12.00
                                                      Setting point w/out aux. spring
G27
```

```
Speed 1/min: 350
Contr.-rod trav.mm: 7.1
Testing:
              1/min : 100
Speed
C-rod trav.mm min: 19.00
              1/min : 350
Speed
C-rod trav.mm
                   : 6.80...7.40
                     : 2.00
C-rod trav.mm
              1/min: 500...560
Speed
TORQUE CONTROL
Torque-control curve - 1st version
1st speed
              1/min : 1200
                   : 11.70...11.80
  C-rod trav.mm
2nd speed 1/min: 600
  C-rod trav.mm : 12.60...12.80
3rd speed 1/min: 700
                     : 12.60...12.80
  C-rod trav.mm
4th speed 1/min: 950
  C-rod trav.mm : 12.20...12.40
FUEL-DELIVERY CHARACTERISTICS
              1/min : 600
Speed
Del.quantity cm3/ : 68.0...70.0
1000H.: (66.0...72.0)
Dispersion cm3/: 5.00
1000H.: (7.00)
Speed 1/min: 900
Del.quantity cm3/: 77.0...79.0
              1000H; (75.0...81.0) cm<sup>3</sup>/: 5.00
Dispersion
              1000H.: (7.00)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.70
Speed
              1/min : 1240...1245
STARTING FUEL DELIVERY
              1/min : 100
Speed
Del.quantity cm3/: 85.0...95.0
              1000H.: (82.0...98.0)
LOW IDLE
Speed
              1/min : 350
Contr.-rod trav.mm: 6.80...7.40
Del.quantity cm3/: 8.0...10.0
1000H.: (6.0...14.0)
Dispersion cm3/: 3.50
              1000H.: (5.00)
Remarks:
```

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column : MB 6,0 D : 25.08.87 Test sheet SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Edition Superceeded : ISO-4113 Calibrating oil BASIC SETTING Combination no. : 0 403 476 029 1st speed 1/mi: 1200 Injection pump Contr.-rod trav.mm: 9.80...9.90 Pump designation : PES6MW100/720RS1124 EP type number : 0 413 406 118 Del.quantity cm3/: 7.6...7.8 Governor : RSV350...1200MW1A316 Governor design. 100H.: (7.4...8.0) -1 Governer no. : 0 420 085 048 Dispersion cm3/:0.3Customer-spec. information Customer 100H.: (0.6) Engine : 0M 366 A 1/min: 350 2nd speed Contr.-rod trav. m: 6.4...7.0

Del.quantity cm3/: 1.0...1.2

100H: (0.8...1.4)

Dispersion cm3/: 0.3

100H: (0.5) 1st version kW : 110.0 Speed 1/min: 2400 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C SLEEVE POSITION : 38...42 Control-lever position Degree: -3 1/min: 800 Overflow valve Speed : 1 417 413 000 Cont.-rod travelmm: 0.30...1.00 Inlet press., bar: 1.50 Governor-spring reload Notch setting x : 4.00 Calibrating nozzle-holder : 0 681 343 009 FULL-LOAD DELIV. AT FULL-LOAD STOP assembly Opening 1st version pressure, bar : 172...175 1/min: 1200 Speed Del.quantity cm3/: 76.0...78.0 1000H.: /74.0...80.0) Dispersion cm3/: 3.50 1000H.: (6.00) Test inj. tubing : 1 680 750 008 Outside diameter x Wall thickness HIGHEST RATED SPEED x Length mm : 6.00x2.00x600 1st version Control-lever (A) Injection pump setting values position degrees: 52...60 Insp. values in parentheses Set constant delivery quant. Testing: 1st c-rod trav.mm : 8.80 per values Speed 1/min: 1240...1245 2nd c-rod trav.mm : 4.00 Speed 1/min : 1280...1293 3rd c-rod trav.mm : 4.00 START OF DELIVERY Test pressure, bar: 30...32 Speed 1/min: 1300...1330 : 3.70...3.80 Prestroke mm : (3.65...3.85) 1/min : 1360 4th speed

H01

```
: 0.30...1.70
  C-rod trav.mm
LOWEST RATED SPEED I
Control-lever
 position degrees: 12...20
Setting point w/out aux. spring
Speed
             1/min : 2.00
Contr.-rod trav.mm: 465...525
SET IDLE AUXILIARY SPRING
Speed 1/min: 350
Contr.-rod trav.mm: 6.40...7.00
TORQUE CONTROL
Torque-control curve - 1st version
             1/min : 1150
1st speed
                      : 9.90...10.10
  C-rod trav.mm
2nd speed 1/min: 750
C-rod trav.mm : 10.60...10.70
3rd speed 1/min : 950
  C-rod trav.mm : 10.30...10.40
FUEL-DELIVERY CHARACTERISTICS
              1/min : 600
Speed
Del.quantity cm3/: 66.0...68.0

1000H.: (64.0...70.0)

Dispersion cm3/: 5.00

1000H.: (7.00)

Speed 1/min: 900
Del.quantity cm3/ : 76.0...78.0
               1000H.: (73.0...81.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 8.80
Speed
              1/min : 1240...1245
STARTING FUEL DELIVERY
              1/min : 100
Speed
Del.quantity cm3/: 80.0...90.0
1000H.: (77.0...93.0)
LOW IDLE
              1/min : 350
Speed
Contr.-rod trav.mm: 6.40...7.00
Del.quantity cm3/: 10.0...12.0
1000H.: (8.00...14.0)
Dispersion cm3/: 3.50
              1000H.: (5.00)
Remarks:
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                            : 3.95...4.05
                                                       Prestroke mm
                                                                            : (3.90...4.10)
Note inst. in remarks column
                                                       Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1-5-3-6-2-4
Test_sheet
                    : IHC 7,6 P 4
: 24.08.87
Edition
Superceeded
                    : 11.85
Calibrating oil
                  : ISO-4113
                                                       SD ang. spacing ^{9}CS: 0-60-120-180-240-300 Tolerance + - ^{9} : 0.50 (0.75)
Combination no.
                    : 0 403 476 030
Injection pump
                                                        SD mark cyl. no. : 1
Pump designation : PES6MW100/320RS1109
EP type number
                    : 0 413 406 104
                                                        BASIC SETTING
Governor
                                                                       1/mi: 800
Governor design.
                    : RSV350...1250MW2/313
                                                        1st speed
                      -3
                                                        Contr.-rod trav.mm: 13.40...13.50
                    : 0 420 085 049
Governer no.
                                                       Del.quantity cm3/: 11.6...11.8
Customer-spec. information
Customer
                    : NAVI-STAR
                                                                      100H.: (11.4...12.0)
Engine
                    : DTI-466 C
                                                        Dispersion
                                                                      cm3/: 0.35
1st version kW : 160.0
               1/min: 2500
                                                                      100H.: (0.6)
Speed
TEST BENCH REQUIREMENTS
                                                                      1/min: 350.0
                                                        2nd speed
                                                        Contr.-rod trav. m: 6.3...6.4
                                                       Del.quantity cm3/: 1.8...2.3
100H.: (1.6...2.5)
Dispersion cm3/: 0.35
100H.: (0.5)
Calibrating-oil inlet temp. OC
                    : 38...42
Overflow valve
                     : 2 417 413 037
                                                        SLEEVE POSITION
                                                       Control-lever position
Inlet press., bar : 2.80
                                                                     Degree: -3
                                                       Speed 17min: 800
Cont.-rod travelmm: 0.30...1.00
Calibrating nozzle-holder
             : 1 688 901 016
 assembly
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
 pressure, bar
                    : 207...210
                                                        1st version
                                                                      1/min: 800
Perforated-plate
                                                       Speed
                                                       Charge press. hPa : 900
 diameter mm
                    : 0.5
                                                       Del.quantity cm3/: 116.5...118.5
1000H.: (114.5...120.5)
Dispersion cm3/: 3.50
Test inj. tubing : 1 680 750 008
                                                                     1000H.: (6.00)
Outside diameter
x Wall thickness
                                                       HIGHEST RATED SPEED
                   : 6.00x2.00x600
x Length mm
                                                       1st version
                                                       Control-lever
(A) Injection pump setting values
                                                        position degrees: 52...57
    Insp. values in parentheses
Set constant delivery quant.
                                                       Testing:
                                                       1st c-rod trav.mm : 11.20
    per values ____
                                                          Speed 1/min: 1290...1300
                                                       2nd c-rod trav.mm : 4.00
START OF DELIVERY
                                                                   1/min : 1390...1400
Test pressure, bar: 30...32
                                                          Speed
HO3
```

3rd c-rod trav.mm : 0.30...1.70 Speed 1/min: 1470 Speed LOWEST RATED SPEED I Control-lever position degrees: 20...28 Setting point w/out aux. spring 1st version 1/min : 350 Speed Contr.-rod trav.mm: 6.35 Testing: Speed Speed 1/min: 100 C-rod trav.mm min: 19.00 Speed 1/min: 350 C-rod trav.mm : 6.3...6.4 SET IDLE AUXILIARY SPRING Contr.-rod trav.mm: 4.00 TORQUE CONTROL Remarks: Torque-control curve - 1st version 1st speed 1/min: 800 C-rod trav.mm : 13.40...13.50 2nd speed 1/min : 1250 C-rod trav.mm : 12.20...12.30 3rd speed 1/min : 840 C-rod trav.mm : 13.40...13.50 4th speed 1/min : 1200 Starting/full-load transition speed from holding magnet = 500 1/min. C-rod trav.mm : 12.20...12.30 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 Speed hPa : 900 Pressure Contr.-rod trav.mm: 13.40...13.50 beforehand.) Measurement 1/min : 500 Speed 1st pressure hPa : 490 C-rod trav.mm : 12.70...13.00 2nd pressure hPa : 200 C-rod trav.mm : 11.80..11.90 3rd pressure hPa : -C-rod trav.mm : 11.40...11.50 shutoff. FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 900 1/min : 1250 Speed Del.quantity cm3/: 105.0...107.0 1000H.: (103.0...109.0) Dispersion cm3/: 6.50 1000H.: (7.00) Charge press. hPa : -H04

1/min : 500 Del.quantity cm3/: 82.0...84.0 1000H:: (79.0...87.0) ROTATIONAL-SPEED LIMITATION 1mm control-rod travel less than full-load trav.mm: 11.20 1/min : 1290...1300 STARTING FUEL DELIVERY 1/min : 100 Del.quantity cm3/: 140.0...180.0 1000H.: (137.0...183.0) Perform pump setting only with IH hose with restriction of 1.2 mm diameter.

Start-of-delivery mark: stop lever 25° toward shutoff: control-rod travel = 9...12 mm. (Free travel of stop lever must have been overcome

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before

Check hydraulic latching of starting fuel delivery with 1.5 bar air.

Position idle auxiliary spring to make contact, then turn back 1/4 rotation

Note inst. in remarks column

Test sheet : PEN 6,1 P : 20.08.87 Edition Superceeded Superceeded : 11.85 Calibrating oil : ISO-4113

Combination no. : 0 403 476 046

Injection pump

Pump designation : PES6MW100/320RS1132

EP type number : 0 413 406 124

Governor

Governor design. : RSV325...1409MW2A314 Governer no. : 0 420 085 053

Customer-spec. information

: VOLVO-PENTA Customer

: TD 61 A Engine

1st version kW : 147.0 Speed 1/min: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter x Wall thickness

: 2.00x6.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

: 2.90...3.00 Prestroke mm

: (2.85...3.05)

Contr.-rod trav.mm: 9.00...12.00

Setting point w/out aux. spring Cam sequence : 1- 5- 3- 6- 2- 4 Speed 1/min : 325 Contr.-rod trav.mm: 5.5 SD ang. spacing  $^{\circ}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{\circ}$ : 0.50 (0.75) Testing: 1/min : 100 Speed Speed 1/min: 19.00
Speed 1/min: 325
Corod trav.mm : 5.50...5.60 BASIC SETTING 1st speed 1/mi: 1000 compensator (LDA,ADA,ALDA) Contr.-rod trav.mm: 10.90...11.00 Del.quantity cm3/: 8.7...8.9 1st version Setting 1/min : 500 hPa : 220 100H.: (8.5...9.1) Speed Pressure Dispersion cm3/:0.3Contr.-rod trav.mm: 10.00...10.10 100H.: (0.6) Measurement 1/min : 500 Speed 2nd speed 1/min: 325 Contr'.-rod trav. m: 6.0...6.1 1st pressure hPa : -Del.quantity cm3/: 1.2...1.6 100H.: (0.9...1.8) Dispersion cm3/: 0.3 100H.: (0.5) C-rod trav.mm : 9.80...9.90 : 330 2nd pressure hPa C-rod trav.mm : 10.20...10.50 3rd pressure hPa : 900 C-rod trav.mm : 10.90...11.00 SLEEVE POSITION Control-lever position FUEL-DELIVERY CHARACTERISTICS Degree: 3 Speed 17min: 800 Cont.-rod travelmm: 0.30...1.00 1st version Charge press. hPa : -FULL-LOAD DELIV, AT FULL-LOAD STOP 1/min : 500 Speed Del.quantity cm3/: 50.0...52.0 1000H.: (48.0...54.0) 1st version Speed 1/min: 1000 Charge press. hPa: 900
Del.quantity cm3/: 87.0...89.0
1000H.: (85.0...91.9)
Dispersion cm3/: 3.50
1000H.: (6.00) STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 140.0...160.0 1000H.: (137.0...163.0) Contr.-rod trav.mm: 19.00...21.00 HIGHEST RATED SPEED 1st version LOW IDLE Control-lever position degrees: 54...62 1/min : 325 Speed Contr.-rod trav.mm: 6.00...6.10 Testing: Del.quantity cm3/: 12.0...16.0 1000H.: (9.5...18.5) 1st c-rod trav.mm : 10.00 Speed 1/min: 1440...1450 cm3/:3.502nd c-rod trav.mm : 4.00 Dispersion 1/min : 1520...1540 1000H.: (5.50) Speed 1/min : 1650 4th speed C-rod trav.mm : 0.30...1.70 Remarks: LOWEST RATED SPEED I Control-lever position degrees: 18...26

**H07** 

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                   Prestroke mm
                                                                       : 3.95...4.05
                                                                      : (3.90...4.10)
Note inst. in remarks column
                                                   Contr.-rod trav.mm: 9.00...12.00
                   : IHC 7,6 R16
                                                                     : 1- 5- 3- 6- 2- 4
Test sheet
                                                   Cam sequence
Edition
                   : 24.08.87
Superceeded
Calibrating oil
                  : ISO-4113
                                                   SD ang. spacing CS: 0-60-120-180-240-300
                   : 0 403 476 050
Combination no.
                                                                        0.50 (.075)
Injection pump
                                                   BASIC SETTING
Pump designation : PES6MW100/320RS1121
EP type number
                   : 0 413 406 115
                                                                 1/mi: 950
                                                   1st speed
Governor
Governor design.
                   : RSV500...1250MW2A312
                                                   Contr.-rod trav.mm: 11.80...11.90
                     -6
                   : 0 420 085 063
                                                   Del.quantity cm3/: 10.8...11.0
Governer no.
                                                                 100H.: (10.6...11.2)
Customer-spec. information
                  : NAVI-STAR
Customer
                                                                 cm3/: 0.35
                                                   Dispersion
                   : DT-466 C
Engine
                                                                 100H.: (0.6)
1st version kW : 160.3
             1/min: 2500
                                                                 1/min: 500
Speed
                                                   2nd speed
                                                   Contr.-rod trav. m: 6.2...6.3
                                                   Del.quantity cm3/: 1.8...2.2
TEST BENCH REQUIREMENTS
                                                                 100H.: (1.3...2.6)
                                                                 cm3/: 0.35
100H.: (0.5)
Calibrating-oil inlet temp. OC
                                                   Dispersion
                   : 38...42
Overflow valve
                                                   SLEEVE POSITION
                   : 2 417 413 D37
                                                   Control-lever position
                                                                Degree: -3
                                                                 1/min: 800
Inlet press., bar : 2.80
                                                   Speed
                                                   Cont.-rod travelmm: 0.30...1.00
Calibrating nozzle-holder
                                                   FULL-LOAD DELIV. AT FULL-LOAD STOP
            : 1 688 901 016
 assembly
                                                   1st version
Opening
                                                                 1/min: 950
                   : 207...210
                                                   Speed
 pressure, bar
                                                   Del.quantity cm3/: 108.0...110.0
1000H.: (106.0...112.0)
Perforated-plate
                                                   Dispersion cm3/ : 3.50
 diameter mm
                   : 0.5
                                                                1000H.: (6.00)
                                                   HIGHEST RATED SPEED
Test inj. tubing
                   : 1 680 750 008
                                                   1st version
                                                   Control-lever
Outside diameter
x Wall thickness
                                                    position degrees: 49...54
x Length mm
                   : 6.00x2.00x600
                                                   Testing:
(A) Injection pump setting values
                                                   1st c-rod trav.mm: 10.60
                                                     Speed 1/min: 1295...1305
    Insp. values in parentheses
Set constant delivery quant.
                                                   2nd c-rod trav.mm : 4.00
Speed 1/min : 1365...1375
    per values
                                                   3rd c-rod trav.mm : 0.30...1.70
START OF DELIVERY
                                                               1/min : 1400
                                                     Speed
Test pressure, bar: 30...32
H09
```

LOWEST RATED SPEED I Control-lever position degrees: 22...30 Setting point w/out aux. spring 1/min : 500 Speed Contr.-rod trav.mm: 6.25 Testing: 1/min : 100 Speed C-rod trav.mm min: 19.00 Speed 1/min: 500 C-rod trav.mm : 6.2...6.3 SET IDLE AUXILIARY SPRING Contr.-rod trav.mm: 4.00 FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 1250 Del.quantity cm3/: 107.0...111.0 1000H.: (105.0...113.0) Dispersion cm3/: 6.50 1000H.: (7.00) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.60 Speed 1/min: 1295...1305 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 140.0...180.0 1000H.: (137.0...183.0) Remarks: Perform pump setting only with IH hose with restriction of 1.2 mm diameter. Starting/full-load transition speed from holding magnet = 500 1/min. Start-of-delivery mark: stop lever 25° toward shutoff: control-rod travel = 9...12 mm. (Free travel of stop lever must have been overcome

beforehand.)

H10

Start-of-delivery mark: stop lever

25° toward shutoff: control-rod travel = 9...12 mm. (Free travel of stop lever must have been overcome beforehand.)

Set shutoff stop 1.5...2.0 mm before shutoff.

Position idle auxiliary spring to make contact, then turn back 1/4 rotation

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                       Contr.-rod trav.mm: 9.00...12.00
                                                       Cam sequence : 1- 5- 3- 6- 2- 4
Note inst. in remarks column
Test sheet
                    : MB 6,0 D 22
: 25.08.87
                                                       SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Edition
                    : 09.03.87
Superceeded
Calibrating oil
                  : ISO-4113
                                                       BASIC SETTING
Combination no.
                    : 0 403 476 054
                                                       1st speed
                                                                     1/mi: 1200
Injection pump
Pump designation : PES6MW100/720RS1139
                                                       Contr.-rod trav.mm: 11.80...11.90
EP type number : 0 413 406 134
                                                       Del.quantity cm3/: 8.3...8.5
Governor
Governor design.
                    : RSV350...1200MW1A316
                                                                     100H.: (8.1...8.7)
                    : 0 420 085 076
Governer no.
                                                                     cm3/:0.35
                                                       Dispersion
Customer-spec. information
Customer
                                                                     100H.: (0.6)
                                                       2nd speed 1/min: 350
Contr.-rod trav. m: 7.0...7.6
Engine
                    : 0M 366 A
1st version kW : 115.0
                                                       Del.quantity cm3/: 1.0...1.2
                                                                     100H.: (0.7...1.5)
              1/min: 2400
Speed
                                                                     cm3/: 0.35
100H:: (0.5)
                                                       Dispersion
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                       SLEEVE POSITION
                                                       Control-lever position
                    : 38...42
                                                                    Degree: -3
1/min: 800
Overflow valve
                    : 1 417 413 000
                                                       Cont.-rod travelmm: 0.30...1.00
                                                      Governor-spring reload Notch setting x : 3.00
Inlet press., bar : 1.50
Calibrating nozzle-holder
           : 0 681 343 009
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
 assembly
                                                       1st version
Opening
 pressure, bar : 172..175
                                                                     1/min: 1200
                                                       Speed
                                                      Del.quantity cm3/: 83.0...85.0
1000H.: (81.0...87.0)
Dispersion cm3/: 3.5
1000H.: (6.00)
Test inj. tubing : 1 680 750 008
Outside diameter
x Wall thickness
                                                      HIGHEST RATED SPEED
x Length mm
                    : 6.00x2.00x600
                                                       1st version
                                                      Control-lever
(A) Injection pump setting values
                                                        position degrees: 64...72
    Insp. values in parentheses
Set constant delivery quant.
                                                       Testing:
    per values
                                                       1st c-rod trav.mm : 10.80
                                                                   1/min : 1240...1245
                                                         Speed
                                                      2nd c-rod trav.mm: 4.00
START OF DELIVERY
                                                         Speed 1/min: 1285...1298
Test pressure, bar: 30...32
                                                       3rd c-rod trav.mm : 4.00
                                                       Speed 1/min: 1335...1365
4th speed 1/min: 1450
                    : 3.70...3.80
: (3.65...3.85)
Prestrake mm
H11
```

```
C-rod trav.mm
                        : 0.30...1.70
LOWEST RATED SPEED I
Setting point w/out aux. spring
                1/min : 350
Speed
Contr.-rod trav.mm: 7.3
Testing:
                1/min: 100
Speed
C-rod trav.mm min : 19.00
Speed 1/min : 350
C-rod trav.mm : 7.00...7.60
C-rod trav.mm
               nm : 2.00
1/min : 515...585
Speed
TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min : 1200
C-rod trav.mm : 11.80...11.90
2nd speed 1/min : 750
C-rod trav.mm : 12.30...12.40
3rd speed 1/min : 1000
  C-rod trav.mm : 11.90...12.10
FUEL-DELIVERY CHARACTERISTICS
Speed
                1/min : 750
Del.quantity cm3/: 81.0...83.0
1000H.: (79.0...85.0)
Dispersion cm3/: 5.00
1000H.: (7.00)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.80
               1/min: 1240...1245
Speed
STARTING FUEL DELIVERY
Speed
                1/min : 100
Del.quantity cm3/: 80.0...90.0
1000H.: (77.0...93.0)
LOW IDLE
Speed 1/min: 350
Contr.-rod trav.mm: 7.00...7.60
Del.quantity cm3/: 10.0...12.0
                1000H.: (7.0...15.0)
cm3/: 3.50
1000H.: (5.00)
Dispersion
Remarks:
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                        Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1-5- 3- 6-
                                                                                                 2- 4
Note inst. in remarks column
                     : MB 6.0 D 31
: 31.07.87
Test sheet
                                                        SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Edition
Superceeded
                     : 13.05.87
                     : ISO-4113
Calibrating oil
                                                        BASIC SETTING
Combination no.
                     : 0 403 476 054
                                                                        1/mi: 1200
                                                         1st speed
Injection pump
Pump designation
                                                        Contr.-rod trav.mm: 11.80...11.90
                     : PES6MW100/720RS1144
EP type number
                     : 0 413 406 138
                                                        Del.quantity cm3/ : 8.3...8.5
Governor
Governor design.
                     : RSV350...1200MW1A316
                                                                       100H.: (8.1...8.7)
                       -2
                     : 0 420 085 076
Governer no.
                                                        Dispersion
                                                                       cm3/:0.3
Customer-spec. information
Customer
                                                                       100H.: (0.6)
                                                        2nd speed 1/min: 350.0

Contrared trav. m: 7.0...7.6

Del.quantity cm3/: 1.0...1.2

100H.: (0.7...1.5)

Dispersion cm3/: 0.3
Engine
                     : 0M366A
1st version kW : 115.0
               1/min: 2400
Speed
                                                                       100H.: (0.5)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                        SLEEVE POSITION
                     : 38...42
                                                        Control-lever position
                                                                      Degree: -3
                                                                       1/min: 800
Overflow valve
                                                        Speed
                     : 1 417 413 000
                                                        Cont.-rod travelmm: 0.30...1.00
Inlet press., bar : 1.50
                                                        Governor-spring reload
                                                        Notch setting x : 3.00
Calibrating nozzle-holder
                    : 0 681 343 009
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
 assembly
Opening
                                                        1st version
 pressure, bar
                    : 172...175
                                                                       1/min: 1200
                                                        Speed
                                                        Del.quantity cm3/: 83.0...85.0
                                                                      1000H.: (81.0...87.0) cm3/ : 3.50
Test inj. tubing : 1 680 750 008
                                                        Dispersion
                                                                      1000H.: (6.00)
Outside diameter
                                                        HIGHEST RATED SPEED
x Wall thickness
                     : 6.00x2.00x600
x Length mm
                                                        1st version
                                                        Control-lever
(A) Injection pump setting values
                                                         position degrees: 63...71
    Insp. values in parentheses
Set constant delivery quant.
                                                        Testing:
                                                        1st c-rod trav.mm : 10.80
    per values ____
                                                        Speed 1/min: 1240...1245
2nd c-rod trav.mm: 4.00
START OF DELIVERY
                                                                     1/min: 1285...1298
Test pressure, bar: 30...32
                                                           Speed
                                                        3rd c-rod trav.mm : 4.00
                                                          Speed 1/min: 1335...1365
                     : 3.70...3.80
Prestroke mm
                                                                      1/min : 1450
                     : (3.65...3.85)
                                                        4th speed
H13
```

```
C-rod trav.mm : 0.30...1.70
LOWEST RATED SPEED I
Setting point w/out aux. spring
Speed
             1/min : 350
Contr.-rod trav.mm: 7.3
Testing:
              1/min : 100
Speed
C-rod trav.mm min : 19.00
              1/min : 350
nm : 7.00...7.60
nm : 2.00
Speed
C-rod trav.mm
C-rod trav.mm
Speed
             1/min : 515...585
TORQUE CONTROL
Torque-control curve - 1st version
C-rod trav.mm : 11.80...11.90
2nd speed 1/min: 750
C-rod trav.mm: 12.30...12.40
3rd speed 1/min: 1000
  C-rod trav.mm : 11.90...12.10
FUEL-DELIVERY CHARACTERISTICS
              1/min : 750
Speed
Del.quantity cm3/: 81.0...83.0
              1000H.: (79.0...85.0)
cm3/: 5.00
1000H.: (7.00)
Dispersion
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.80
             1/min : 1240...1245
Speed
STARTING FUEL DELIVERY
Speed
              1/min : 100
Del.quantity cm3/: 80.0...90.0
1000H.: (77.0...93.0)
Contr.-rod trav.mm: 19.00...21.00
LOW IDLE
Speed 1/min: 350
Contr.-rod trav_mm: 7.00...7.60
Del.quantity cm3/: 10.0...12.0
              1000H.: (7.0...15.0)
cm3/: 3.50
1000H.: (5.00)
Dispersion
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Contr.-rod trav.mm: 9.00...12.00
                                                      Cam sequence : 1-5-3-6-2-4
Note inst. in remarks column
                    : MB 6.0 D 33
: 31.07.87
Test sheet
                                                      SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Edition
                    : 05.06.87
Superceeded
Calibrating oil
                    : ISO-4113
                                                      BASIC SETTING
Combination no.
                    : 0 403 476 056
                                                      1st speed
                                                                    1/mi: 1200
Injection pump
                                                      Contr.-rod trav.mm: 10.00...10.10
Pump designation
                    : PES6MW100/720RS1144
EP type number
                    : 0 413 406 138
                                                      Del.quantity cm3/ : 7.5...7.7
Governor
                    : RSV350...1200MW1A316
Governor design.
                                                                    100H.: (7.3...7.9)
                    : 0 420 085 078
Governer no.
                                                                    cm3/:0.3
                                                      Dispersion
Customer-spec. information
Customer
                    : DAIMLER-BENZ
                                                                    100H.: (0.6)
Engine
                    : 0M366A
                                                      2nd speed
                                                                    1/min: 350.0
                                                      Contr.-rod trav. m: 6.1...6.7
                                                      Del.quantity cm3/: 1.0...1.2
100H.: (0.7...1.5)
1st version kW : 100.0
Speed
              1/min: 2400
                                                                    cm3/: 0.3
100H.: (0.5)
                                                      Dispersion
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                      SLEEVE POSITION
                    : 38 ... 42
                                                      Control-lever position
                                                                   Degree: -3
1/min: 800
Overflow valve
                    : 1 417 413 000
                                                      Cont.-rod travelmm: 0.30...1.00
                                                      Governor-spring reload Notch setting x : 3.50
Inlet press., bar : 1.50
Calibrating nozzle-holder
           : 0 681 343 009
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
 assembly
                                                      1st version
Opening
 pressure, bar : 172...175
                                                                    1/min: 1200
                                                      Speed
                                                      Del.quantity cm3/: 75.0...77.0
1000H:: (73.0...79.0)
Dispersion cm3/: 3.50
Test inj. tubing : 1 680 750 008
                                                                   1000H.: (6.00)
Outside diameter
x Wall thickness
                                                      HIGHEST RATED SPEED
x Length mm
                    : 6.00x2.00x600
                                                      1st version
                                                      Control-lever
                                                       position degrees: 58...66
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                      Testing:
    per values
                                                      1st c-rod trav.mm: 10.5
                                                                  1/min : 1240...1245
                                                        Speed
                                                      2nd c-rod trav.mm: 4.00
START OF DELIVERY
                                                                  1/min: 1271...1284
Test pressure, bar: 30...32
                                                        Speed
                                                      3rd c-rod trav.mm: 4.00
                                                        Speed 1/min: 1290...1320
                   : 3.70...3.80
Prestroke mm
                    : (3.65...3,85)
                                                                   1/min : 1450
                                                      4th speed
H15
```

C-rod trav.mm : 0.30...1.70 5th speed 1/min: 1240...1255 : 9.00 C-rod trav.mm LOWEST RATED SPEED I Control-lever position degrees: -Setting point w/out aux. spring 1/min : 350 Speed Contr.-rod trav.mm: 6.4 Testing: 1/min : 100 Speed C-rod trav.mm min: 19.00 Speed 1/min: 350 : 6.10...6.70 C-rod trav.mm : 2,00 C-rod trav.mm 1/min : 415...475 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1200 C-rod trav.mm : 10.00...10.10 2nd speed 1/min: 800 C-rod trav.mm : 10.90...11.00 1/min : 900 3rd speed C-rod trav.mm : 10.90...11.00 4th speed 1/min : 1050 C-rod trav.mm : 10.30...10.50 FUEL-DELIVERY CHARACTERISTICS 1/min : 800 Speed Del.quantity cm3/: 73.0...75.0 1000H.: (71.0...78.0) cm3/:5.00Dispersion 1000H.: (7.00) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.5 1/min : 1240...1245 Speed STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 80.0...90.0 1000H.: (77.0...93.0) Contr.-rod trav.mm: 19.00...21.00 LOW IDLE 1/min : 350 Speed Contr.-rod trav.mm: 6.10...6.70 Del.quantity cm3/: 10.0...12.0 1000H.: (7.0...15.0)

H16

Dispersion cm3/: 3.50 1000H.: (5.00)

Note inst. in remarks column

Test sheet : MB 6.0 D 35 : 31.07.87 Edition

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 403 476 059

Injection pump

Pump designation : PES6MW100/720RS1130

EP type number : 0 413 406 122

Governor

Governor design. : RSV300...1250MW0A325 Governer no. : 0 420 085 083

Customer-spec. information Customer

Engine : OM 366 A

1st version kW : 125.0 1/min: 2500 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1-5-3-6-2-4 SD ang. spacing  $^{0}$ CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) BASIC SETTING 1/mi: 1230 1st speed Contr.-rod trav.mm: 11.50...11.60 Del.quantity cm3/: 8.2...8.4 100H.: (8.0...8.6) cm3/:0.3Dispersion 100H.: (0.6) 1/min: 575.0 2nd speed Contr.-rod trav. m: 4.7...4.8

Del.quantity cm3/: 1.0...1.4

100H.: (0.8...1.6)

Dispersion cm3/: 0.3 100H.: (0.5) SLEEVE POSITION Control-lever position Degree: -3 1/min: 800 Speed Cont.-rod travelmm: 0.30...1.00 FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version 1/min: 1230 Speed Del.quantity cm3/: 82.0...84.0 1000H.: (80.0...86.0) cm3/: 3.50 1000H.: (6.00) Dispersion HIGHEST RATED SPEED 1st version Control-lever position degrees: 46...54 Testing: 1st c-rod trav.mm : 10.50 Speed 1/min : 1250...1260 2nd c-rod trav.mm : 4.00 1/min : 1280...1310 Speed 1/min : 1350 4th speed : 0.30...1.70 C-rod trav.mm LOWEST RATED SPEED I Control-lever position degrees: 24...32 Setting point w/out aux. spring

#18

Speed 1/min : 575 Contr.-rod trav.mm: 4.7 Testing: 1/min : 100 Speed C-rod trav.mm min : 19.00 1/min : 575 Speed C-rod trav.mm : 4.70...4.80 FUEL-DELIVERY CHARACTERISTICS 1/min : 600 Speed Del.quantity cm3/: 67.5...71.5 1000H.: (65.5...73.5) Dispersion cm3/: 5.00 1000H.: (7.00) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.50 1/min : 1250...1260 Speed STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 80.0...90.0 1000H.: (77.0...93.0) LOW IDLE

Speed 1/min: 575 Contr.-rod trav.mm: 4.70...4.80 Del.quantity cm3/: 10.0...14.0 1000H.: (8.0...16.0) Dispersion cm3/: 3.50

1000H.: (5.00)

```
: 1- 8- 7- 2- 6- 5-
4- 3
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                    Cam sequence
Note inst. in remarks column
Test sheet
                   : KHD 13,4 A
                                                    SD ang. spacing CS: 0-45-90-135-180-225-
Edition
                   : 20.08.87
Superceeded
                   : 12.85
                                                                         270-315
                                                    Tolerance + - 0
Calibrating oil
                   : ISO-4113
                                                                       : 0.50 (0.75)
Combination no.
                   : 0 403 548 007
                                                    BASIC SETTING
Injection pump
                                                    1st speed
                                                                1/mi: 1150
Pump designation : PE8MW100/720LS1118
EP type number
                   : 0 413 508 102
                                                    Contr.-rod trav.mm: 12.10...12.20
Governor
Governor design. : RQV300...1150MW56
                                                    Del.quantity cm3/: 12.9...13.1
Governer no.
                   : 0 420 083 075
                                                                 100H.: (12.7...13.3)
Customer-spec. information
Customer
                   : KHD
                                                                 cm3/:0.3
                                                   Dispersion
                   : BF8L513
Engine
                                                                 100H.: (0.6)
1st version kW : 222.0
                                                                 1/min: 300.0
                                                    2nd speed
                                                    Contr.-rod trav. m: 6.9...7.0
Spead
             1/min: 2300
                                                   Del.quantity cm3/: 1.6...2.0
                                                                 100H.: (1.3...2.2)
cm3/: 0.3
TEST BENCH REQUIREMENTS
                                                   Dispersion
Calibrating-oil inlet temp. C
                                                                 100H.: (0.5)
                   : 38...42
                                                    SLEEVE POSITION
Overflow valve
                                                   Control-lever position
                   : 1 417 413 000
                                                                Degree: -1
                                                                 17min: 1175
                                                   Speed
Inlet press., bar : 1.50
                                                   Cont.-rod travelmm: 15.20...17.80
Calibrating nozzle-holder
                                                   FULL-LOAD DELIV. AT FULL-LOAD STOP
                  : 0 681 343 009
 assembly
                                                   1st version
                                                                 1/min: 1150
Opening
                                                   Speed
 pressure, bar : 172...175
                                                   Charge press. hPa : 800
                                                   Del.quantity cm3/: 129.0...131.0
                                                   1000H.: (127.0...133.0)
Dispersion cm3/: 3.50
1000H.: (6.00)
Test in j. tubing : 1 680 740 014
Outside diameter
x Wall thickness
                                                   HIGHEST RATED SPEED
x Length mm
                : 6.00x2.00x600
                                                   1st version
                                                   Control-lever
                                                    position degrees: 51...59
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                   Testing:
    per values ____
                                                    1st c-rod trav.mm : 11.10
                                                     Speed 1/min: 1190...1200
START OF DELIVERY
                                                   2nd c-rod trav.mm : 4.00
                                                              1/min : 1280...1310
1/min : 1400
Test pressure, bar: 30...32
                                                     Speed
                                                   4th speed
                                                                      : 0.00...1.00
                   : 3.10...3.20
Prestroke mm
                                                     C-rod trav.mm
                   : (3.05...3.25)
Contr.-rod trav.mm: 9.00...12.00
                                                   LOWEST RATED SPEED I
H20
```

Control-lever position degrees: 18...26 Setting point w/out aux. spring 1/min : 300 Speed Contr.-rod trav.mm: 6.9 C-rod trav.mm min : 8.50 1/min : 300 Speed : 6.90...7.00 C-rod trav.mm CONSTANT REGULATION Speed 1/min : 330...400 TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1150 : 12.10...12.20 C-rod trav.mm 1/min : 700 2nd speed C-rod trav.mm : 12.50...12.60 3rd speed 1/min: 900 C-rod trav.mm : 12.30...12.40 compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 Speed Pressure hPa : 360 Contr.-rod trav.mm: 12.20...12.30 Measurement 1/min : 500 Speed 1st pressure hPa : 11.40...11.50 C-rod trav.mm 2nd pressure hPa : 260 : 11.70...12.00 C-rod trav.mm 3rd pressure hPa : 800 : 12.50...12.60 C-rod trav.mm SWITCH-OVER POINT 1/min : 230 (250) Speed FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 800 1/min : 700 Speed Del.quantity cm3/: 133.0...135.0 1000H.: (131.0...137.0) cm3/:5.00Dispersion 1000H.: (7.00) Charge press. hPa : -1/min : 450 Speed Del.quantity cm3/: 104.0...106.0 1000H.: (101.5...108.5) ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod trayel less than

full-load trav.mm: 11.10 1/min : 1190...1200 Speed

STARTING FUEL DELIVERY

1/min : 100 Speed Del.quantity cm3/: 140.0...150.0 1000H.: (137.0...153.0)

LOW IDLE

Speed 1/min : 300 Contr.-rod trav.mm: 6.90...7.00 Del.quantity cm3/: 16.00...20.00 1000H.: (13.5...22.5) cm3/: 3.50 1000H.: (5.50)

Dispersion

Note inst. in remarks column

Test sheet : KHD 13,4 D4
Edition : 20.08.87
Superceeded : 11.85
Calibrating oil : ISO-4113

Combination no. : 0 403 548 014

Injection pump

Pump designation : PE8MW100/720LS1128

EP type number : 0 413 508 103

Governor

Governor design. : RQ300...1150MW63-2

: 0 420 082 019 Governer no.

Customer-spec. information Customer : KHD

: BF8L513 Engine

1st version kW : 235.0 Speed 1/min: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly `

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 740 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

: 3.10...3.20 Prestroke mm : (3.05...3.25) Contr.-rod trav.mm: 9.00...12.00

: 1- 8- 7- 2- 6- 5-Cam sequence 1st version Control-lever position degrees: 34...42 Setting point: SD ang. spacing CS: 0-45-90-135-180-225-1/min : 600 Speed 270-315 Contr.-rod trav.mm: 20.0 Tolerance + - 0 : 0.50 (0.75) Testing: BASIC SETTING 1st c-rod trav.mm : 13.00 Speed 1/min: 1190...1200 2nd c-rod trav.mm: 4.00 1st speed 1/mi: 1150 1/min : 1285...1315 Speed Contr.-rod trav.mm: 13.90...14.00 4th speed 1/min: 1370 C-rod trav.mm : 0.00...1.00 Del.quantity cm3/: 14.1...14.3 LOWEST RATED SPEED I 100H.: (13.9...14.5) Control-lever position degrees: 8...16 Setting point w/out aux. spring Speed 1/min: 300 cm3/:0.3Dispersion 100H.: (0.6) Contr.-rod trav.mm: 7.7 2nd speed 1/min: 300.0 Contr.-rod trav. m: 7.7...7.8 Testing: 1/min : 100 Speed Del.quantity cm3/: 1.3...1.7 100H.: (1.1...1.9) C-rod trav.mm min : 9.30 Speed 1/min : 300 cm3/: 0.3 100H.: (0.5) Dispersion C-rod trav.mm : 7.70...7.80 CONSTANT REGULATION 1/min: 330...400 (B) Setting of injection pump with Speed externally-mounted governor TORQUE CONTROL SLEEVE TRAVELS Torque-control curve - 1st version 1st speed 1/min: 1280 1/min : 1150 1st speed Sleeve travel mm: 9.00...9.8 C-rod trav.mm : 13.90...14.00 2nd speed 1/min: 700 2nd speed 1/min: 1150 Sleeve travel mm: 6.60...6.80

3rd speed 1/min: 650
 Sleeve travel mm: 5.80...6.20

4th speed 1/min: 300 C-rod trav.mm : 14.90...15.00 3rd speed 1/min : 950 C-rod trav.mm : 14.20...14.50 compensator (LDA,ADA,ALDA) Sleeve travel mm: 1.20...2.00 SLEEVE POSITION Control-lever position 1st version Degree: -2 1/min: 600 Setting Speed Speed 1/min : 500 Cont.-rod travelmm: 19.20...20.80 Pressure hPa : 480 Contr.-rod trav.mm: 14.40...14.50 FULL-LOAD DELIV, AT FULL-LOAD STOP Measurement 1/min : 500 1st version Speed Speed 1/min: 1150 Charge press. hPa : 900 Pel.quantity cm3/ : 141.0...143.0 1st pressure hPa : 900 C-rod trav.mm : 14.90...15.00 1000H.: (139.0...145.0) cm3/: 3.50 2nd pressure hPa : -: 12.70...12.80 C-rod trav.mm Dispersion 1000H.: (6.00) 3rd pressure hPa : 330 C-rod trav.mm : 13.20...13.50 HIGHEST RATED SPEED H23

```
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 900
Speed 1/min : 700
Del.quantity cm3/: 153.0...155.0
1000H.: (151.0...157.0)
                cm3/: 5.00
1000H.: (7.00)
Dispersion
Charge press. hPa : -
Speed 1/min : 4
                1/min : 450
Del.quantity cm3/: 107.0...109.0
1000H.: (105.0...111.0)
STARTING FUEL DELIVERY
Speed
                1/min : 100
Del.quantity cm3/: 135.0...155.0
1000H.: (132.0...158.0)
LOW IDLE
Speed 1/min: 300
Contr.-rod trav.mm: 7.70...7.80
Del.quantity cm3/: 13.0...17.0
                1000H.: (11.0...19.0)
cm3/: 3.50
1000H.: (5.50)
Dispersion
Remarks:
Check electrically unlatched starting
fuel delivery (EES) with 24 volt.
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                           : 1- 8- 7- 2- 6- 5-
                                                       Cam sequence
Note inst. in remarks column
Test sheet
                    : KHD 13,4 D9 : 24.08.87
                                                       SD ang. spacing CS: 0-45-90-135-180-225-
Edition
Superceeded
                                                                             270-315
                                                       Tolerance + - D
Calibrating oil
                    : ISO-4113
                                                                           : 0.50 (0.75)
                    : 0 403 548 019
                                                       BASIC SETTING
Combination no.
Injection pump
                                                                     1/mi: 900
                                                       1st speed
Pump designation : PE8MW100/720LS1118
EP type number
                    : 0 413 508 102
                                                       Contr.-rod trav.mm: 11.00...11.10
Governor
Governor design. : RQV425...900MW76
Governer no. : 0 420 083 114
                                                       Del.quantity cm3/: 10.3...10.5
                                                                     100H.: (10.1...10.7)
Customer-spec. information
                    : KHD
Customer
                                                       Dispersion
                                                                     cm3/:0.3
                    : BF8L513
Engine
                                                                     100H.: (0.6)
                                                                     1/min: 425.0
1st version kW : 160.0
                                                       2nd speed
              1/min: 1800
                                                       Contr.-rod trav. m: 6.0...6.1
Speed
                                                      Del.quantity cm3/: 1.3...1.7
100H:: (1.1...1.9)
Dispersion cm3/: 0.3
100H:: (0.5)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                    : 38...42
                                                       (B) Setting of injection pump with
Overflow valve
                                                           externally-mounted governor
                    : 1 417 413 000
                                                      SLEEVE TRAVELS
                                                      1st speed 1/min: 950
Sleeve travel mm: 8.70...8.80
Inlet press., bar : 1.50
                                                      2nd speed 1/min: 1000
Calibrating nozzle-holder
                                                         Sleeve travel mm: 9.70...10.10
 assembly
                  : 0 681 343 009
                                                       3rd speed 1/min: 600
                                                         Sleeve travel mm: 3.90...4.50
Opening
pressure, bar
                    : 172...175
                                                       4th speed 1/min: 425
                                                         Sleeve travel mm: 1.60...2.00
Test inj. tubing : 1 680 740 014
                                                      SLEEVE POSITION
                                                      Control-lever position
Outside diameter
                                                                    Degree: -1
                                                                     1/min: 925
x Wall thickness
                                                      Speed
                  : 6.00x2.00x600
                                                      Cont.-rod travelmm: 15.20...17.80
x Length mm
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                      1st version
                                                      Speed 1/min: 900
Del.quantity cm3/: 103.0...105.0
1000H.: (101.0...107.0)
Dispersion cm3/: 3.50
    per values
START OF DELIVERY
Test pressure, bar: 30...32
                                                                    1000H.: (6.00)
Prestroke mm
                    : 3.10...3.20
                    (3.05...3.25)
                                                      HIGHEST RATED SPEED
Contr.-rod trav.mi: 9.00...12.00
                                                      1st version
H25
```

```
Control-lever
 position degrees: 51...59
Testing:
1st c-rod trav.mm : 10.00
            1/min: 940...950
  Speed
2nd c-rod trav.mm : 4.50
            1/min : 985...1015
  Speed
LOWEST RATED SPEED I
Control-lever
 position degrees: 20...28
Setting point w/out aux. spring
            1/min : 425
Contr.-rod trav.mm: 6.05
Speed
             1/min : 425
                 : 6.00...6.10
C-rod trav.mm
CONSTANT REGULATION
             1/min: 435...520
Speed
TORQUE CONTROL
Torque-control curve - 1st version
            1/min: 900
1st speed
  C-rod trav.mm : 11.00...11.10
2nd speed 1/min: 600
C-rod trav.mm : 11.60...11.70
3rd speed 1/min : 750
C-rod trav.mm : 11.20...11.50
SWITCH-OVER POINT
             1/min: 360 (400)
Speed
FUEL-DELIVERY CHARACTERISTICS
             1/min : 600
Speed
Del.quantity cm3/: 109.0...111.0
             1000H.: (107.5...113.0)
cm3/: 5.00
Dispersion
             1000H.: (7.00)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10.00
Speed
            1/min: 940...950
STARTING FUEL DELIVERY
            1/min : 100
Speed
Del.quantity cm3/: 140.0...150.0
             1000H.: (137.0...153.0)
LOW IDLE
            1/min : 425
Speed
Contr.-rod trav.mm: 6.00...6.10
```

H26

Del.quantity cm3/: 13.0...17.0 1000H.: (11.0...19.0) Dispersion cm3/: 3.5 1000H.: (5.50)

Note inst. in remarks column

Test sheet : NWM 5,9 B : 24.07.87 Edition Superceeded : 4.85 Calibrating oil : 180-4113

Combination no. : 9 400 085 246

Injection pump

Pump designation : PES6A90D320RS2705 EP type number : 9 400 083 098

Governor

Governor design. : RSV350...1400A2B2179

-1R

: 9 420 083 196 Governer no.

Customer-spec. information Customer

: A 229-6 PID Engine

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 003

Outside diameter

x Wall thickness x Length mm

6 SAND DOX 600

(A) Injection pump secting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Contr.-rod trav.mm: 9:00...12.00 Cam sequence : 1-5-3-6-2-4

LOWEST RATED SPEED I SD ang. spacing CS: 0-60-120-180-240-300 Toterance + - : 0.50 (0.75) Control-lever position degrees: 14...22 Setting point w/out aux. spring Speed 1/min : 325 SD mark cyl. no. : 1 Contra-rod trav.mm: 6.0 BASIC SETTING Testing: 1/mi: 1400 1/min : 100 1st speed Speed C-rod trav.mm min : 19.00 1/min : 325 Contr.-rod trav.mm: 10.30...10.40 Speed C-rod trav.mm : 6.50 Del.quantity cm3/: 8.5...8.6 C-rod trav.mm : 2.00 1/min : 430...490 Speed 100H.: (8.3...8.8) TORQUE CONTROL Dispersion cm3/:0.3Torque-control curve - 1st version 1st speed 1/min : 1400 100H.: (0.5) C-rod trav.mm : 10.30...10.40 2nd speed 1/min: 500 2nd speed 1/min: 325 C-rod trav.mm : 11.00...11.10 Contr.-rod trav. m: 6.40...6.60 Del.quantity cm3/: 1.3...1.7 100H.: (1.1...1.9) 4th speed 1/min: 900 C-rod trav.mm : 10.70...11.00 cm3/:0.2Dispersion FUEL-DELIVERY CHARACTERISTICS 100H.: (0.4) 1/min : 500 Speed Del.quantity cm3/: 87.0...89.0 1000H:: (84.5...91.5) Speed 1/min: 900 SLEEVE POSITION Control-lever position Degree: -3 17min: 800 Del.quantity cm3/: 90.0...92.0 1000H.: (87.5...94.5) Speed Cont.-rod travelmm: 0.30...1.00 ROTATIONAL-SPEED LIMITATION Governor-spring reload Notch setting x : 4.50 1st version 1mm control-rod travel less than FULL-LOAD DELIV. AT FULL-LOAD STOP full-load trav.mm: 9.30 1/min: 1440...1450 Speed 1st version Speed 1/min: 1400 Charge press. hPa : -STARTING FUEL DELIVERY Del.quantity cm3/: \$5.5...86.5 1000H: (8.5...88.5) Dispersion cm3/: 3.00 1000H: (5.00) Speed 1/min : 100 Contr.-rod trav.mm: 19.00...21.00 HIGHEST RATED SPEED LOW IDLE 1st version Control-lever 1/min : 325 Speed Contr.-rod trav.mm: 4.00...4.50 position degrees: 58...66 Remarks: Testing: 1st c-rod trav.mm : 9,30 Speed 1/min: 1440...1450 2nd c-rod trav.mm : 4.00 Speed 1/min: 1515...1545 3rd c-rod trav.mm : 4.00

4th speed 1/min: 1600

C-rod trav.mm : 0.30...1.70

Contr.-rod trav.mm: 9,00...12,00 Cam sequence : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column : FOR 6,6 A3 : 27.8.87 Test sheet SD ang. spacing  $^{0}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{0}$ : 0.50 (0.75) Edition Superceeded : 2.86 Calibrating oil : 180-4113 SD mark cyl. no. : 1 Combination no. : 9 400 085 263 START OF DELIVERY DIFFERENCE Injection pump betw.c-rod trav.mm: 9,00...12,00 & c-rod tray max. : 21,00 Difference CS : 2,00...3,00 : PES6A95D410RS2688 Pump designation EP type number : 9 400 083 090 Governor Governor design. : RQV350...1400AB1202-BASIC SETTING : 9 420 080 220 Governer no. 1/mi: 1400 1st speed Customer-spec. information : FORD (FTO) Contr.-rod trav.mm: 10,10...10,20 Customer Del.quantity cm3/: 7,0...7,2 Engine : 6,6 1 NA 1st version kW : 103.0 100H.: (6,8...7,4) 1/min: 2800 Speed Dispersion cm3/: 0.35TEST BENCH REQUIREMENTS 100H.: (0,60) Calibrating-oil inlet temp. °C : 38...42 1/min: 350 2nd speed Contr.-rod trav. m: 6,40...6,60 Overflow valve Del.quantity cm3/: 0,7...1,1 100H.: (0,5...1,3) cm3/: 0,35 100H.: (0,55) : 1 417 413 000 Dispersion Inlet press., bar : 1.00 (B) Setting of injection pump with Calibrating nozzle-holder : 0 681 343 009 externally-mounted governor assembly SLEEVE TRAVELS ûpening pressure, bar : 172...175 1st speed 1/min: 350 Sleeve travel mm: 1,30...1,60 2nd speed 1/min: 700 Sleeve travel mm: 4,20...4,60 3rd speed 1/min: 1100 Test inj. tubing : 1 680 750 008 Sleeve travel mm: 6,10...6,40 Outside diameter 4th speed 1/min: 1400 x Wall thickness x Length mm : 6,00x2,00x600 Sleeve travel mm: 8,50...8,60 SLEEVE POSITION (A) Injection pump setting values Control-lever position Insp. values in parentheses Set constant delivery quant. Degree: -1 17min: 1420 per values Speed Cont.-rod travelmm: 15,20...17,80 START OF DELIVERY FULL-LOAD DELIV. AT FULL-LOAD STOP Test pressure, bar: 25...27 : 3,15...3,25 : (3,10...3,30) 1st version Prestroke mm 1/min: 1400 Speed

J02

Del.quantity cm3/: 70,5...72,5 1000H: (68,5...74,5) Dispersion cm3/: 3,5 1000H.: (6,0) HIGHEST RATED SPEED 1st version Control-lever position degrees: 59...57 Testing: 1st c-rod trav.mm : 9.10 Speed 1/min : 1440...1450 2nd c-rod trav.mm : 4.00 Speed 1/min : 1540...1570 4th speed 1/min: 1700 C-rod trav.mm : 0,00...1,00 LOWEST RATED SPEED I Control-lever position degrees: 10...18 Testing: 1/min : 100 Speed C-rod trav.mm min : 9.00 1/min : 350 Speed C-rod trav.mm : 6,40...6,60 mm : 2.00 1/min : 540...600 C-rod trav.mm Speed SWITCH-OVER POINT Speed 1/min : 290 (310) FUEL-DELIVERY CHARACTERISTICS 1/min : 800 Speed Del.quantity cm3/: 60.0...63.0 1000H.: (57,5...65,5) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 9,10 1/min : 1440...1450 Speed STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 112,0...122,0 1000H.: (-) Contr.-rod trav.mm: 19,0...21,0 LOW IDLE Speed 1/min : 350

Del.quantity cm3/: 7.0...11.0 1000H.: (5.0...13.0) Dispersion cm3/: 3.5 1000H.: (5.5)

Remarks:

Contr.-rod trav.mm: 6,40...6,60

Note inst. in remarks column

Test sheet : FOR 6,6 H
Edition : 21.05.87
Superceeded : 6.86
Calibrating oil : ISO-4113

Combination no. : 9 400 085 265

Injection pump

Pump designation : PES6A95D410RS2722 EP type number : 9 400 084 004 Governor

Governor design. : RQV350...1300AB1220L Governer no. : 9 420 080 223

Customer-spec. information

Customer : FORD NEW HOLLAND

Engine : 6.6 1 TC

1st version kW : 119.3 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.00

Calibrating nozzle-holder assembly : 1 688 901 017

assembly . 1 000 70. 0

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.6

Test inj. tubing : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_\_

START OF DELIVERY
Test pressure har: 25.

Prestroke mm : 3.15...3.25 Dispersion cm3/ : 3.50 : (3.10...3.30) 1000H.: (6.00) Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 5- 3- 6- 2- 4 HIGHEST RATED SPEED 1st version Control-lever position degrees: 58...66 SD ang. spacing  $^{\circ}$  CS: 0-60-120-180-240-300 Tolerance + -  $^{\circ}$  : 0.50 (0.75) Testina: 1st c-rod trav.mm: 9.20 Speed 1/min: 1360...1370 SD mark cyl. no. : 1 2nd c-rod trav.mm : 4.00 Speed 1/min: 1430...1460 th speed 1/min: 1600 BASIC SETTING 4th speed 1/mi: 1300 C-rod trav.mm : 0.00...1.00 1st speed Contr.-rod trav.mm: 10.20...10.30 LOWEST RATED SPEED I Control-lever Del.quantity cm3/ : 7.5...7.7 position degrees: 8...16 100H.: (7.3...7.9) Testing: Speed 1/min: 100 C-rod trav.mm min: 7.50 Dispersion cm3/:0.3Speed 1/min: 350 C-rod trav.mm : 4.90...5.10 C-rod trav.mm : 2.00 100H.: (0.6) 1/min: 490...550 2nd speed 1/min: 350.0 Speed Contr.-rod trav. m: 4.9...5.1
Del.quantity cm3/: 1.1...1.5
100H.: (0.9...1.7)
Dispersion cm3/: 0.3
100H.: (0.5) CONSTANT REGULATION 1/min : 370...440 Speed compensator (LDA, ADA, ALDA) (B) Setting of injection pump with externally-mounted governor 1st version Setting 1/min : 500 hPa : 700 SLEEVE TRAVELS Speed 1st speed 1/min: 350
Sleeve travel mm: 1.20...1.50
2nd speed 1/min: 550
Sleeve travel mm: 3.00...3.30
3rd speed 1/min: 1000 Pressure Contr.-rod trav.mm: 10.20...10.30 Measurement 1/min : 500 Speed Sleeve travel mm: 5.80...6.20 4th speed 1/min: 1340 Sleeve travel mm: 8.50...8.60 ist pressure hPa : -C-rod trav.mm : 9.20...9.30 2nd pressure hPa : 450 C-rod trav.mm : 9.80...10.00 SLEEVE POSITION 3rd pressure hPa : 360 Control-lever position Degree: -1 : 9.40...9.50 C-rod trav.mm 17min: 1340 Cont.-rod travelmm: 15.20...17.80 SWITCH-OVER POINT FULL-LOAD DELIV. AT FULL-LOAD STOP 1/min : 290 (310) Speed FUEL-DELIVERY CHARACTERISTICS 1st version Speed 1/min: 1300 Charge press. hPa: 700 Del.quantity cm3/: 75.0...77.0 1000H.: (73.0...79.0) 1st version Charge press. hPa: 700 Speed 1/min : 800 J05

```
Del.quantity cm3/: 62.0...65.0
1000H.: (60.5...66.5)
Charge press. hPa : -
Speed 1/min : 5
Speed 1/min: 500
Del.quantity cm3/: 53.0...55.0
1000H.: (51.0...57.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 9.20
Speed
              1/min : 1360...1370
STARTING FUEL DELIVERY
LOW IDLE
               1/min : 350
Speed
Contr.-rod trav.mm: 4.90...5.10
Del.quantity cm3/: 11.0...15.0
1000H.: (9.0...17.0)
Dispersion cm3/: 3.50
1000H.: (5.50)
Remarks:
```

Note inst. in remarks column

Test sheet : MWM 3.9 D Edition : 24.07.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 9 400 085 272

Injection pump

Pump designation : PES4A90D320RS2744 EP type number : 9 400 084 012

Governor

Governor design. : RSV350...1300A2B2215

Governer no. : 9 420 083 234

Customer-spec. information Customer : MWM

Engine : TD 229-4

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 046

Inlet press., bar: 1.00

Calibrating nozzle-holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80 : (2.65...2.85)

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 3- 4- 2

2nd c-rod trav.mm: 4.00 Speed 1/min: 1410...1440 SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) 3rd c-rod trav.mm : 4.00 4th speed 1/min : 1600 C-rod trav.mm : 0.30...1.70 SD mark cyl. no. : 1 LOWEST RATED SPEED I START OF DELIVERY DIFFERENCE Control-lever position degrees: 55...63
Setting point w/out aux. spring
Speed 1/min: 350 betw.c-rod trav.mm: 9.00...12.00 & c-rod tray max. : 21.00 Difference CS : 3.00...4.00 Contr.-rod trav.mm: 4.5 BASIC SETTING Testing: 1/min : 100 Speed 1st speed 1/mi: 1300 C-rod trav.mm min: 19.00 Speed 1/min: 350 C-rod trav.mm : 5.00 C-rod trav.mm : 2.00 Speed 1/min : 540...600 Contr.-rod trav.mm: 10.60...10.70 Del.quantity cm3/: 8.9...9.0 100H.: (8.7...9.2) TORQUE CONTROL Torque-control curve - 1st version cm3/:0.31/min : 1300 Dispersion 1st speed C-rod trav.mm : 10.60...10.70 d speed 1/min : 500 100H.: (0.5) 2nd speed C-rod trav.mm : 11.20...11.30 3rd speed 1/min : 800 2nd speed 1/min: 350 Contr.-rod trav. m: 4.90...5.10 Del.quantity cm3/: 1.1...1.5 100H.: (0.9...1.7) C-rod trav.mm : 10.90...11.20 4th speed 1/min: 900 C-rod trav.mm : 10.80...10.90 cm3/:0.2Dispersion 100H.: (0.4) FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 500 Del.quantity cm3/: 87.0...89.0 1000H:: (84.5...91.5) Speed 1/min: 900 SLEEVE POSITION Control-lever position Degree: -3 Del.quantity cm3/: 89.0...91.0 1000H.: (86.5...93.5) Speed 17min: 800 Cont.-rod travelmm: 0.30...1.00 ROTATIONAL-SPEED LIMITATION Governor-spring reload Notch setting x : 5.75 1st version FULL-LOAD DELIV. AT FULL-LOAD STOP 1mm control-rod travel less than full-load trav.mm: 9.60 1st version Speed 1/min: 1340...1350 Speed 1/min: 1300 Del.quantity cm3/: 89.0...90.0 1000H.: (87.0...92.0) Dispersion cm3/: 3.00 1000H.: (5.00) STARTING FUEL DELIVERY 1/min : 100 Contr.-rod tray.mm: 19.00...21.00 HIGHEST RATED SPEED 1st version LOW IDLE Control-lever position degrees: 24...32 1/min : 350 Speed Contr.-rod trav.mm: 4.90...5.10 Testing: Del.quantity cm3/: 11.0...15.0 1000H.: (9.0...17.0) 1st c-rod trav.mm : 9.60 Speed 1/min: 1340...1350

J08

Dispersion cm3/: 2.50 1000H.: (4.50)

Remarks:

Note inst. in remarks column

Test sheet Edition : MB 6.0 E : 24.07.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 9 400 085 288

Injection pump

Pump designation : PES6A90D410RS2596-1

EP type number : 9 400 084 008

Governor

: RQV300...1300AB1066-Governor design.

: 9 420 080 230 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M 366 A Engine

1st version kW : 127.0 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. <sup>D</sup>C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar : 1.00

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2- 4 Dispersion cm3/: 3.00 1000H.: (5.00) HIGHEST RATED SPEED 1st version SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Control-lever position degrees: 116...124 SD mark cyl. no. : 1 Testing: 1st c-rod trav.mm : 12.10 Speed 1/min : 1340...1350 BASIC SETTING 2nd c-rod trav.mm: 4.00 1/mi: 1300 Speed 1/min: 1470...1500 1st speed 3rd c-rod tray.mm : 4.00 Contr.-rod trav.mm: 13.10...13.20 4th speed 1/min: 1600 C-rod trav.mm : 0.00...1.00 Del.quantity cm3/ : 8.6...8.7 LOWEST RATED SPEED I 100H.: (8.4...8.9) Control-lever position degrees: 74...82 Dispersion cm3/:0.3Testing: 100H.: (0.5) 1/min : 100 Speed C-rod trav.mm min : 10.00 1/min: 300.0 2nd speed 1/min : 300 Speed Contr.-rod trav. m: 8.4...8.6 C-rod trav.mm : 8.40...8.60 Del.quantity cm3/: 1.0...1.4 100H.: (0.8...1.6) Dispersion cm3/: 0.2 100H.: (0.4) C-rod trav.mm : 2.00 1/min : 570...630 Speed CONSTANT REGULATION Speed 1/min : 590...660 (B) Setting of injection pump with externally-mounted governor TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1300 SLEEVE TRAVELS 1st speed 1/min: 300
Sleeve travel mm: 0.70...1.30
2nd speed 1/min: 500
Sleeve travel mm: 2.20...2.60 C-rod trav.mm : 13.10...13.20 2nd speed 1/min : 800 C-rod trav.mm : 14.10...14.20 3rd speed 1/min : 1000 3rd speed 1/min: 800 C-rod trav.mm : 13.90...14.10 Sleeve travel mm: 4.30...4.70 4th speed 1/min: 1100 4th speed 1/min: 1150 C-rod trav.mm : 13.30...13.60 Steeve travel mm: 6.10...6.40 5th speed 1/min: 1375 Steeve travel mm: 8.40...8.50 compensator (LDA, ADA, ALDA) SLEEVE POSITION 1st version Setting Control-lever position Degree: -1 1/min : 500 Speed 17min: 1375 hPa : 1000 Speed Cont.-rod travelmm: 15.20...17.80 Contr.-rod trav.mm: 14.10...14.20 FULL-LOAD DELIV. AT FULL-LOAD STOP Measurement 1/min : 500 Speed 1st version Speed 1/min: 1300 1st pressure hPa : -C-rod trav.mm : 12.80...12.90 2nd pressure hPa : 750 C-rod trav.mm : 13.90...14.00 Charge press. hPa: 1000 Del.quantity cm3/: 86.0...87.0 1000H.: (84.0...89.0) 3rd pressure hPa : 650

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: 13.20...13.40
  C-rod trav.mm
SWITCH-OVER POINT
Speed
               1/min : 240 (260)
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 1000
Speed 1/min : 800
Del.quantity cm3/: 89.0...91.0
1000H: (86.5...93.5)
Charge press. hPa: 1000
Speed
               1/min : 1000
Del.quantity cm3/: 90.0...92.0
1000H.: (87.5...94.5)
Charge press. hPa : -
               1/min : 500
Speed
Del.quantity cm3/: 66.5...68.5
1000H.: (64.5...70.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 12.10
              1/min: 1340...1350
Speed
STARTING FUEL DELIVERY
               1/min : 100
Speed
Del.quantity cm3/: 71.0...81.0
1000H.: (68.0...84.0)
Contr.-rod trav.mm: 14.70...15.70
Remarks:
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Note inst. in remarks column

: MB 11,8 01 : 24.07.87 Test sheet Edition

Superceeded

Calibrating oil : ISO-4113

: 9 400 087 256 Combination no.

Injection pump

Pump designation : PE6P110A720RS371 EP type number : 0 411 816 123

Governor

Governor design. : RQ250/1100PA419R

Governer no. : 9 420 080 138

Customer-spec, information

Customer : DAIMLER-BENZ

: OM 355 A Engine

1st version kW : 210.0 Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 004

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1-5-3-6-2-4 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) SD mark cyl. no. : 1 BASIC SETTING 1/mi: 1100 1st speed Contr.-rod trav.mm: 11.70...11.80 Del.quantity cm3/: 16.0...15.2 100H.: (15.7...16.5) Dispersion cm3/:0.4100H.: (0.7) 2nd speed 1/min: 250.0 Contr.-rod trav. m: 5.9...6.1

Del.quantity cm3/: 1.1...1.6

100H.: (0.8...1.8)

Dispersion cm3/: 0.4

100H.: (0.7) SLEEVE POSITION Control-lever position Degree: -1 Speed 17min: 600 Cont.-rod travelmm: 15.60...16.40 FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version 1/min: 1100 Speed Del.quantity cm3/: 160.0...162.0 1000H.: (157.0...165.0) Dispersion cm3/: 4.00 1000H.: (7.50) HIGHEST RATED SPEED Setting point: 1/min : 600 Speed Contr.-rod trav.mm: 16.0 Testing: 1st c-rod trav.mm : 10.70 Speed 1/min: 1145...1160 2nd c-rod trav.mm : 4.00 1/min : 1210...1240 Speed 3rd c-rod trav.mm: 4.00 4th speed 1/min: 1300 C-rod tray.mm : 0.00...1.00

LOWEST RATED SPEED I Setting point w/out aux. spring 1/min : 250 Speed Contr.-rod trav.mm: 6.0 Testing: Speed 1/min: 100 C-rod trav.mm min: 7.50 Speed 1/min: 250 : 6,00 C-rod trav.mm mm : 2.00 1/min : 390...430 1/min : 500 C-rod trav.mm Speed Speed C-rod trav.mm max: 1.00 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 500 Del.quantity cm3/: 149.0...153.0 1000H.: (146.0...156.0) SETTING CONTROL-ROD STOP 1/min : 500 Speed ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.70 Speed 1/min: 1145...1160 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 144.0...160.0

1000H.: (-) Contr.-rod trav.mm: 12.70...13.10

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                        Cam sequence : 1-5-3-6-2-4
Note inst. in remarks column
                                                        SD ang. spacing ^{\circ}CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0,50 (0,75)
Test sheet
                     : CAT 10.5 H
                     : 10.8.87
Edition
Superceeded
Calibrating oil : ISO-4113
                                                        SD mark cyl. no. : 1
Combination no.
                     : 9 400 087 281
                                                        BASIC SETTING
Injection pump
                                                                        1/mi: 1000
                                                        1st speed
Pump designation : PES6P80A720LS456
EP type number
                     : 9 400 087 020
                                                        Contr.-rod trav.mm: 12,80...12,90
Governor
Governor design.
Governer no.
                    : RQV350...1000PA637
                                                        Del.quantity cm3/ : 11,6...11,7
                     : 9 420 080 158
                                                                       100H.: (11,4...11,8)
Customer-spec. information
Customer
                                                                       cm3/:0.25
                     : CATERPILLAR
                                                        Dispersion
                     : 3306 T
Engine
                                                                       100H.: (0,40)
                                                        2nd speed 1/min: 350
Contr.-rod trav. m: 6,70...6,90
Del.quantity cm3/: 0,9...1,6
100H.: (0,7...1,8)
Dispersion cm3/: 0,20
1st version kW : 110.4
               1/min: 2000
Speed
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                                       100H.: (0,35)
                     : 38...42
                                                        SLEEVE POSITION
Overflow valve
                                                        Control-lever position
                     : 1 417 413 000
                                                                      Degree: -1
1/min: 1010
                                                        Speed
Inlet press., bar : 1.5
                                                        Cont.-rod travelmm: 15,20...17,80
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzle-holder
                   : 0 681 343 009
 assembly
                                                        1st version
                                                        Speed 1/min: 1000
Del.quantity cm3/: 116.0...117.0
1000H.: (114.5...118.5)
Dispersion cm3/: 2.5
Opening
 pressure, bar : 172...175
Test inj. tubing : 1 680 750 004
                                                                      1000h.: (4.0)
Outside diameter
                                                        HIGHEST RATED SPEED
x Wall thickness
                                                        1st version
x Length mm
                    : 6,00x1,50x600
                                                        Control-lever
                                                         position degrees: 65...74
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                        Testing:
                                                        1st c-rod trav.mm : 11,80
    per values
                                                           Speed 1/min: 1030...1040
                                                        2nd c-rod trav.mm : 4,00
START OF DELIVERY
                                                                    1/min : 1100...1130
                                                           Speed
                                                        4th speed 1/min: 1220
Test pressure, bar: 25...27
                                                          C-rod trav.mm
                                                                             : 0,00...1,00
Prestroke mm
                     : 1,65...1,75
                     : (1,60...1,80)
                                                        LOWEST RATED SPEED I
Contr.-rod trav.mm: 9,00...12,00
                                                        Control-lever
J16
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position degrees: 13...21
Testing:
Speed
            1/min : 250
C-rod trav.mm min: 11,00
            1/min : 350
Speed
                  : 5,90...6,10
C-rod trav.mm
            nm : 2,00
1/min : 510...570
C-rod trav.mm
Speed
CONSTANT REGULATION
Speed
            1/min : 300...400
TORQUE CONTROL
Dimension a mm : 0,60
Torque-control curve - 1st version
           1/min : 1000
1st speed
                  : 12,80...12,90
  C-rod trav.mm
          1/min : 870
2nd speed
  C-rod trav.mm
                 : 13,00...13,30
3rd speed 1/min : 700
  C-rod trav.mm : 13,30...13,50
4th speed 1/min: 500
                 : 13,40...13,50
  C-rod trav.mm
SWITCH-OVER POINT
Speed
            1/min : 290 (310)
FUEL-DELIVERY CHARACTERISTICS
Speed
            1/min : 700
Del.quantity cm3/: 115.0...117.0
1000H:: (114.0...118.0)
Speed 1/min: 500
Del.quantity cm3/: 112,5...114,5
            1000H.: (111,5...115,5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11,80
Speed
            1/min : 1030...1040
STARTING FUEL DELIVERY
Contr.-rod trav.mm: 17,60...18,60
LOW IDLE
Speed
            1/min : 350
Contr.-rod trav.mm: 5,90...6,10
Remarks:
Start-of-delivery setting with ROBO
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J17

diaphragm.

Note inst. in remarks column

Test sheet Edition : CAT 10.5 A4 : 10.8.87

Superceeded

Calibrating oil : ISO-4113

: 9 400 087 282 Combination no.

Injection pump

Pump designation : PES6P80A720LS456 EP type number : 9 400 087 029

Governor

Governor design. : RQV350...950PA609 Governer no. : 9 420 080 154

Customer-spec. information

Customer : CATERPILLAR

Engine : 3306 T

1st version kW : 103.0 1/min: 1900 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.5

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 004

Outside diameter

x Wall thickness

: 6,00X1,50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

: 1,65...1,75 Prestroke mm : (1,60...1,80)

Contr.-rod trav.mm: 9,00...12,00

Cam sequence : 1-5-3-6-2-4 position degrees: 13...21 Testing: 1/min : 250 Speed SD ang. spacing  $^{0}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{0}$ : 0,50 (0,75) C-rod trav.mm min : 11,00 1/min : 350 Speed C-rod trav.mm : 5,90...6,10 nm : 2,00 1/min : 510...570 SD mark cyl. no. : 1 C-rod trav.mm Speed BASIC SETTING CONSTANT REGULATION 1st speed 1/mi: 950 Speed 1/min: 300...400 Contr.-rod trav.mm: 12.20...12.30 TORQUE CONTROL Dimension a mm : 0,90 Torque-control curve - 1st version Del.quantity cm3/: 10,5...10,6 1st speed 1/min: 950 100H.: (11,3...10,7) : 12,20...12,30 C-rod trav.mm 2nd speed 1/min: 800 cm3/:0,25: 12,60...12,90 Dispersion C-rod trav.mm 3rd speed 1/min : 700 100H.: (0,40) C-rod trav.mm : 13,00...13,20 4th speed 1/min: 500 C-rod trav.mm : 13,10...13,20 1/min: 350 2nd speed Contr.-rod trav. m: 6,7...6,9 Del.quantity cm3/: 0,9...1,6 100H: (0,7...1,8) Dispersion cm3/: 0,20 100H: (0,35) SWITCH-OVER POINT 1/min : 290 (310) Speed FUEL-DELIVERY CHARACTERISTICS SLEEVE POSITION Speed 1/min : 700 Del.quantity cm3/: 111,0...113,0 Control-lever position 1000H.: (110,0...114,0) Degree: -1 Speed 1/min: 1010 1/min : 500 Speed Del.quantity cm3/: 108.0...110.0 1000H.: (107.0...111.0) Cont.-rod travelmm: 15,20...17,80 FULL-LOAD DELIV. AT FULL-LOAD STOP ROTATIONAL-SPEED LIMITATION 1st version Speed 1/min: 950 1st version Del.quantity cm3/: 105.0...106.0 1000H.: (113.5...107.5) Dispersion cm3/: 2.5 1000H.: (3,5) 1mm control-rod travel less than full-load trav.mm: 11,20 1/min: 980...990 Speed HIGHEST RATED SPEED STARTING FUEL DELIVERY 1st version Control-lever position degrees: 62...71 1/min : 100 Speed Del.quantity cm3/: 152,0...172,0 1000H.: (-) Testing: 1st c-rod trav.mm : 11.20 Speed 1/min : 980...990 Contr.-rod trav.mm: 17,60...18,60 2nd c-rod trav.mm : 4,00 LOW IDLE Speed 1/min : 1050...1080 4th speed 1/min : 1150 1/min : 350 Contr.-rod trav.mm: 5,90...6,10 C-rod trav.mm : 0,00...1.00 LOWEST RATED SPEED I Control-lever Start-of-delivery setting with ROBO

J19

diaphragm. J20

Note inst. in remarks column

Test sheet : CAT 10,5 A5 : 10.8.87 Edition

Superceeded

Calibrating oil : ISO-4113

: 9 400 087 289 Combination no.

Injection pump

: PES6P80A720LS456 Pump designation : 9 400 087 029 EP type number

Governor

Governor design. : RQV350...1000PA609

Governer no. : 9 420 080 165

Customer-spec. information

: CATERPILLAR Customer

: 3306 T Engine

1st version kW : 121.4 1/mir: 2000 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.5

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 004

Outside diameter x Wall thickness

: 6,00X1,50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 25...27

: 1,65...1,75 Prestroke mm

: (1,60...1,80)

Contr.-rod trav.mm: 9,00...12,00

Testina: 1/min : 250 Speed SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0,50 (075) C-rod trav.mm min : 11.00 Speed 1/min : 350 C-rod trav.mm : 5,90...6,10 C-rod trav.mm : 2,00 Speed 1/min : 510...570 SD mark cyl. no. : 1 BASIC SETTING CONSTANT REGULATION 1/min : 300...400 1st speed 1/mi: 1000 Speed Contr.-rod trav.mm: 13,40...13,20 TORQUE CONTROL Dimension a mm : 0,90 Del.quantity cm3/: 12,1...12,2 Torque-control curve - 1st version 1/min : 1000 1st speed 100H.: (12,1...12,3) C-rod trav.mm : 13.10...13.20 2nd speed 1/min: 850 Dispersion cm3/:0.25C-rod trav.mm : 13,30...13,60 3rd speed 1/min : 700 C-rod trav.mm : 13,90...14,10 4th speed 1/min : 500 100H.: (0,40) : 14,00...14,10 1/min: 350 2nd speed C-rod trav.mm Contr.-rod trav. m: 6,7...6,9 Del.quantity cm3/: 0,95...1,65 100H.: (0,80...1,90) SWITCH-OVER POINT cm3/: 0.20Dispersion Speed 1/min : 290 (310) 100H.: (0,35) FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 700
Del.quantity cm3/: 126,0...128,0
1000H.: (124,0...130,0)
Speed 1/min: 500 SLEEVE POSITION Control-lever position Degree: -1 1/min: 1010 Speed Cont.-rod travelmm: 15,20...17,80 Del.quantity cm3/: 122,5...124,5 1000H.: (120,5...126,5) FULL-LOAD DELIV. AT FULL-LOAD STOP ROTATIONAL-SPEED LIMITATION 1st version Speed 1/min: 1000
Del.quantity cm3/: 121.5...122.5
1000H.: 121.0...123.0
Dispersion cm3/: 2.5 1st version 1mm control-rod travel less than full-load trav.mm: 12,10 1000H.: (4.0) Speed 1/min : 1030...1040 HIGHEST RATED SPEED STARTING FUEL DELIVERY 1st version Control-lever position degrees: 66...75 Speed 1/min : 100 Del.quantity cm3/: 152.0...172.0 1000H:: (-) Testing: 1st c-rod trav.mm : 12.10 Speed 1/min : 1030...1040 Contr.-rod trav.mm: 17,60...18,60 2nd c-rod trav.mm : 4,00 LOW IDLE Speed 1/min : 1110...1140 4th speed 1/min : 1230 1/min : 350 Contr.-rod trav.mm: 5.90...6.10 C-rod tray.mm : 0.00...1.00 LOWEST RATED SPEED I Remarks: Control-lever

position degrees: 13...21

Cam sequence : 1-5-3-6-2-4

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Cam sequence
                                                                         : 1-5-3-6-2-4
Note inst. in remarks column
                                                      SD ang. spacing ^{0}CS: 0-60-120-180-240-300 Tolerance + - ^{10}: 0.50 (0.75)
                    : CAT 10.5 A : 10.8.87
Test sheet
Edition
Superceeded
                    : 7.84
Calibrating oil
                   : 180-4113
                                                      SD mark cyl. no.
Combination no.
                   : 9 400 087 292
                                                      BASIC SETTING
Injection pump
                                                      1st speed
                                                                     1/mi: 990
Pump designation
                   : PES6P80A720LS456
EP type number
                   : 9 400 087 029
                                                      Contr.-rod trav.mm: 12.50...12.60
Governor
Governor design. : RQV350...1000PA609-1
                                                      Del.quantity cm3/: 11,1...11,2
Governer no.
                   : 9 420 080 172
                                                                    100H.: (10,9...11,3)
Customer-spec. information
Customer
                    : CATERPILLAR
                                                      Dispersion
                                                                    cm3/:0.20
                    : 3306 T
Engine
                                                                    100H.: (0,35)
1st version kW : 110.4
                                                                    1/min: 350
                                                      2nd speed
              1/min: 2000
                                                      Contr.-rod trav. m: 6,70...6,90
Speed
                                                     Del.quantity cm3/: 0,95...1,65
100H:: (-)
Dispersion cm3/: 0,20
100H:: (0,30)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                    : 38...42
                                                      (B) Setting of injection pump with
Overflow valve
                                                          externally-mounted governor
                    : 1 417 413 000
                                                      SLEEVE TRAVELS
Inlet press., bar : 1.5
                                                      1st speed 1/min: 325
                                                        Sleeve travel mm: 0,50...2,00
                                                                  1/min: 400
Calibrating nozzle-holder
                                                      2nd speed
                                                        Sleeve travel mm: 2,70...3,10
                   : 0 681 343 009
 assembly
                                                                   1/min: 500
                                                      3rd speed
                                                        Sleeve travel mm: 2,50...4,20 h speed 1/min: 800
Opening
pressure, bar : 172...175
                                                      4th speed
                                                        Sleeve travel mm: 6,10...6,60
                                                      5th speed 1/min: 1010
                   : 1 680 750 015
                                                        Sleeve travel mm: 8,40...8,60
Test inj. tubing
                                                      SLEEVE POSITION
Outside diameter
x Wall thickness
                                                      Control-lever position
x Length mm
                  : 6,00x1,50x600
                                                                  Degree: -1
                                                                   17min: 1010
                                                      Speed
                                                     Cont.-rod travelmm: 15,20...17,80
(A) Injection pump setting values
    Insp. values in parentheses
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
    Set constant delivery quant.
    per values
                                                     1st version
START OF DELIVERY
                                                                    1/min: 990
                                                     Speed
                                                     Del.quantity cm3/: 111.0...112.0
1000H.: (109.5...113.5)
Dispersion cm3/: 2.0
1000H.: (3.5)
Test pressure, bar: 25...27
                    : 1,65...1,75
Prestroke mm
                    : (1,60...1,80)
Contr.-rod trav.mm: 9,00...12,00
124
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HIGHEST RATED SPEED 1st version Control-lever position degrees: 65...74 Testing: 1st c-rod trav.mm : 11,50 Speed 1/min : 1020...1030 2nd c-rod trav.mm : 4,00 1/min : 1090...1120 Speed 1/min : 1220 4th speed C-rod trav.mm : 0,00...1,00 LOWEST RATED SPEED I Control-lever position degrees: 13...21 Testing: 1/min : 250 Speed C-rod trav.mm min: 11.00 Speed 1/min : 350 nm : 5,90...6,10 nm : 2,00 1/min : 510...570 C-rod trav.mm C-rod trav.mm Speed CONSTANT REGULATION 1/min: 300...400 Speed TORQUE CONTROL Dimension a mm : 1.00 Torque-control curve - 1st version 1/min : 990 1st speed : 12,50...12,60 C-rod trav.mm 1/min : 500 2nd speed : 13,50...13,60 C-rod trav.mm 3rd speed 1/min: 700 : 13,40...13,60 C-rod trav.mm 4th speed 1/min: 850 C-rod tray.mm : 12,80...13,10 SWITCH-OVER POINT Speed 1/min : 290 (310) FUEL-DELIVERY CHARACTERISTICS 1/min : 500 Speed Del.quantity cm3/: 117.0...119.0 1000H.: (114.0...118.0) Speed 1/min: 700 Del.quantity cm3/: 114,5...116,5 1000H.: (113,5...117,5) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 11,50 Speed 1/min : 1020...1030

STARTING FUEL DELIVERY

Speed 1/min: 100 Del.quantity cm3/: 152,0...172,0 1000H.: (-)

Contr.-rod trav.mm: 17,60...18,60

LOW IDLE

Speed 1/min: 350 Contr.-rod trav.mm: 5,90...6,10

Remarks: Start-of-delivery setting with ROBO diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence : 1-3-4-2 Note inst. in remarks column SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0,50 (0,75) : CAT 7,0 A6 Test sheet : 10.8.87 Edition Superceeded Calibrating oil : ISO-4113 SD mark cyl. no. : 1 : 9 400 087 293 Combination no. BASIC SETTING Injection pump 1/mi: 950 1st speed Pump designation : PES4P80A720LS440 EP type number : 9 400 087 028 Contr.-rod trav.mm: 11,65...11,75 Governor Governor design. : RQV350...950PA609-2 Del.quantity cm3/: 9,0...9,1 Governer no. : 9 420 080 173 100H.: (8,8...9,3) Customer-spec. information Customer : CATERPILLAR Dispersion cm3/:0.25100H.: (0,40) Engine : 3304 1st version kW : 65.5 2nd speed 1/min: 350 Contr.-rod trav. m: 6,7...6,9
Del.quantity cm3/: 0,8...1,3
100H: (0,6...1,4)
Dispersion cm3/: 0,20 1/min: 1900 Speed TEST BENCH REQUIREMENTS Calibrating-cil inlet temp. °C 100H.: (0,35) : 38...42 SLEEVE POSITION Control-lever position Overflow valve : 1 417 413 000 Degree: -1 17min: 1010 Speed Cont.-rod travelmm: 15,20...17,80 Inlet press., bar : 1.5 FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating nozzle-holder : 0 681 343 009 assembly 1st version Opening 1/min: 950 Speed pressure, bar : 172...175 Del.quantity cm3/: 90,5...91,5 1000H:: (88,5...93,5) cm3/ : 2,5 Dispersion Test inj. tubing : 1 680 750 015 1000H.: (4,0) Outside diameter HIGHEST RATED SPEED x Wall thickness 1st version : 6,00x1,50x600 Control-lever x Length mm position degrees: 62...71 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Testing: 1st c-rod trav.mm : 10,65 Speed 1/min: 980...990 2nd c-rod trav.mm: 4.00 Speed 1/min: 1055...1085 per values START OF DELIVERY 1/min : 1150 Test pressure, bar: 25...27 4th speed C-rod trav.mm : 0,00...1.00 Prestroke mm : 1,95...2,05 : (1,90...2,10) LOWEST RATED SPEED I Contr.-rod trav.mm: 9,00...12,00 Control-lever

J26

```
position degrees: 15...23
Testing:
            1/min : 250
Speed
C-rod trav.mm min : 11,00
            1/min : 350
Speed
                  : 6,30...6,50
C-rod trav.mm
                   : 2,00
C-rod trav.mm
            1/min : 540...600
Speed
CONSTANT REGULATION
            1/min: 300...400
Speed
TORQUE CONTROL
Dimension a mm : 0,80
Torque-control curve - 1st version
            1/min : 950
1st speed
                   : 11,65...11,75
  C-rod trav.mm
2nd speed 1/min: 800
  C-rod trav.mm
                   : 12,00...12,30
3rd speed 1/min: 700
C-rod trav.mm : 12,35...12,55
4th speed 1/min : 500
  C-rod trav.mm
                  : 12,45...12,55
SWITCH-OVER POINT
            1/min : 290 (310)
Speed
FUEL-DELIVERY CHARACTERISTICS
Speed
            1/min : 700
Del.quantity cm3/: 100,0...102,0
            1000H.: (98,0...104,0)
            1/min : 500
Speed
Del.quantity cm3/: 95.5...97.5
1000H.: (93.5...99.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
full-load trav.mm: 10,65
            1/min: 980...990
Speed
STARTING FUEL DELIVERY
Speed
            1/min : 100
Del.quantity cm3/: 152,0...172,0
            1000H.: (-)
Contr.-rod trav.mm: 17,60...18,60
LOW IDLE
            1/min : 350
Speed
Contr.-rod trav.mm: 6,30...6,50
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS : 1-3-4-2 Cam sequence Note inst. in remarks column Test sheet SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0,50 (0,75) : CAT 7.0 A7 : 11.8.87 Edition Superceeded Calibrating oil : ISO-4113 SD mark cyl. no. : 1 Combination no. : 9 400 087 294 BASIC SETTING Injection pump 1st speed 1/mi: 1000 Pump designation : PES4P80A720LS440 EP type number : 9 400 087 028 Contr.-rod trav.mm: 11,60...11,70 Governor Governor design. : RQV350...1000PA613-1 Del.quantity cm3/ : 9,0...9,1 Governer no. : 9 420 080 174 100H.: (8,8,..9,3) Customer-spec. information Customer : CATERPILLAR Dispersion cm3/:0.25: 3304 NA Engine 100H.: (0,40) 1st version kW : 58.8 1/min: 350 2nd speed 1/min: 2000 Contr.-rod trav. m: 6,70...6,90 Speed Del.quantity cm3/: 0.8...1.2 100H: (0.7...1.3) Dispersion cm3/: 0.20 100H: (0.35) TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C : 38...42 SLEEVE POSITION Overflow valve Control-lever position : 1 417 413 000 Degree: -1 1/min: 1000 Speed Inlet press., bar: 1.5 Cont.-rod travelmm: 15,20...17,80 Calibrating nozzle-holder FULL-LOAD DELIV. AT FULL-LOAD STOP : 0 681 343 009 assembly 1st version Opening 1/min: 1000 Speed Del.quantity cm3/: 90.0...91.0 1000H: (88.0...93.0) Dispersion cm3/: 2.5 pressure, bar : 172...175 1000H.: (4,0) Test inj. tubing : 1 680 750 015 HIGHEST RATED SPEED Outside diameter x Wall thickness 1st version : 6,00x1,50x600 Control-lever x Length mm position degrees: 66...75 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Testing: 1st c-rod trav.mm : 10,60 Speed 1/min : 1030...1040 per values 2nd c-rod trav.mm : 4.00 Speed 1/min : 1100...1130 START OF DELIVERY Test pressure, bar: 25...27 4th speed 1/min : 1180 C-rod trav.mm : 1,95...2,05 Prestroke mm : (1,90...2,10) LOWEST RATED SPEED I Contr.-rod trav.mm: 9,00...12,00 Control-lever

J28

```
position degrees: 17...25
Testing:
             1/min : 250
Speed
G-rod trav.mm min : 11,00
Speed
            1/min : 350
C-rod trav.mm
                   : 6,50...6,70
                   : 2,00
C-rod trav.mm
             1/min : 550...610
Speed
CONSTANT REGULATION
             1/min : 300...400
Speed
TORQUE CONTROL
Dimension a mm : 0,50
Torque-control curve - 1st version
1st speed 1/min: 1000
  C-rod trav.mm
                   : 11,60...11,70
2nd speed 1/min : 850
C-rod trav.mm : 11,70...12,00
3rd speed 1/min : 700
  C-rod trav.mm
                   : 12,00...12,20
4th speed 1/min: 500
                 20,...12,20
  C-rod trav.mm
SWITCH-OVER POINT
             1/min : 290 (310)
Speed
FUEL-DELIVERY CHARACTERISTICS
             1/min : 700
Del.quantity cm3/ : 95,0...97,0
             1000H: (92,5...99,5)
1/min: 500
Speed
Del.quantity cm3/: 90.0...92.0
1000H:: (87,5...94,5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 10,60
Speed
             1/min : 1030...1040
STARTING FUEL DELIVERY
Speed 1/min: 100
Del.quantity cm3/: 152,0...172,0
1000H.: (-)
Contr.-rod trav.mm: 17,60...18,60
LOW IDLE
             1/min : 350
Speed
Contr.-rod trav.mm: 6,50...6,70
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence : 1-3-4-2 Note inst. in remarks column Test sheet SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0,50 (0,75) : CAT 7.0 B : 11.8.87 Edition Superceeded : 11.85 Calibrating oil : ISO-3114 BASIC SETTING Combination no. : 9 400 087 301 1st speed 1/mi: 1000 Injection pump Contr.-rod trav.mm: 12,20...12,30 Pump designation : PES4P80A720LS852 EP type number : 9 400 087 034 Del.quantity cm3/: 10,6...10.7 Governor Governor design. : RQV350...1000PA609-1 100H.: (10.5...10.9) Governer no. : 9 420 080 172 cm3/:0.25Dispersion Customer-spec. information 100H.: (0,35) Customer : CATERPILLAR Engine : 3304 T 1/min: 350 2nd speed Contr.-rod trav. m: 6,70...6,90 Del.quantity cm3/: 0.9...1.6 100H.: (0.7...1.8) 1st version kW : 78.7 Speed 1/min: 2000 cm3/:0,20Dispersion TEST BENCH REQUIREMENTS 100H.: (0,30) Calibrating-oil inlet temp. OC SLEEVE POSITION : 38...42 Control-lever position Degree: -1 17min: 1010 Overflow valve Speed : 1 417 413 000 Cont.-rod travelmm: 15,20...17,80 FULL-LOAD DELIV. AT FULL-LOAD STOP Inlet press., bar: 1.5 Calibrating nozzle-holder 1st version : 0 681 343 009 1/min: 1000 assembly Speed Del.quantity cm3/: 106.5...107.5 1000H.: (105.0...109.0) Opening cm3/ : 2.5 1000H.: (3,5) pressure, bar : 172...175 Dispersion Test inj. tubing **: 1** 680 750 015 HIGHEST RATED SPEED 1st version Outside diameter Control-lever x Wall thickness position degrees: 64...72 : 6,00X1,50X600 x Length mm Testing: 1st c-rod trav.mm : 11.20 Speed 1/min : 1030...1040 2nd c-rod trav.mm : 4.00 Speed 1/min : 1110...1140 4th speed 1/min : 1200 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values C-rod trav.mm : 0.00...1.00 START OF DELIVERY Test pressure, bar: 25...27 LOWEST RATED SPEED I : 1.65...1.75 : (1.60...1.80) Control-lever Prestroke mm position degrees: 13...21 Contr.-rod trav.mm: 9,00...12,00

K02

```
Testing:
             1/min : 350
Speed
C-rod trav.mm min: 11,50
Speed
            1/min : 350
                 : 6,30...6,50
C-rod trav.mm
             nm : 2,00
1/min : 530...590
C-rod trav.mm
Speed
CONSTANT REGULATION
             1/min: 320...420
Speed
TORQUE CONTROL
Dimension a mm : 1,00
Torque-control curve - 1st version
            1/min : 1000
1st speed
  C-rod trav.mm : 12,20...12,30
            1/min : 850
2nd speed
                    : 12,70...12,90
  C-rod trav.mm
3rd speed 1/min: 700
C-rod trav.mm : 13,10...13,30
4th speed 1/min : 500
  C-rod trav.mm : 13,20...13,30
SWITCH-OVER POINT
Speed
             1/min : 290 (310)
FUEL-DELIVERY CHARACTERISTICS
Speed 1/min: 700
Del.quantity cm3/: 113.0...115.0
1000H.: (111.0...117.0)
Speed 1/min: 500
Del.quantity cm3/: 109_0...112_0
             1000H.: (107,0...113,0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11,20
Speed
             1/min : 1030...1040
STARTING FUEL DELIVERY
Speed
             1/min : 100
Contr.-rod trav.mm: 17,60...18,60
LOW IDLE
             1/min : 350
Contr.-rod trav.mm: 6,30...6,50
Remarks:
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BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence : 1-2-4-5-3 Note inst. in remarks column SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0,50 (0,75) : MB 10,0 E : 11.8.87 Test sheet Edition : 7.86 Superceeded : ISO-4113 Calibrating oil SD mark cyl. no. Combination no. : 9 400 087 308 BASIC SETTING Injection pump 1st speed 1/mi: 1050 Pump designation : PE5P110A720RS479 Contr.-rod trav.mm: 12,20...12,30 EP type number : 9 400 087 040 Governor Governor design. : R0300/1050PA718-1 Del.quantity cm3/: 16,1...16,3 Governer no. : 9 420 080 187 100H.: (15,8...16,6) Customer-spec. information cm3/:0,40Customer : DAIMLER-BENZ Dispersion : 0M355-5 A 100H.: (0,75) Engine 1st version kW : 170 1/min: 300 2nd speed 1/min: 2100 Contr.-rod trav. m: 6,40...6,60 Speed Del.quantity cm3/: 1,1...1,6 100H.: (-) TEST BENCH REQUIREMENTS Dispersion cm3/:0,45100H.: (0,75) Calibrating-oil inlet temp. °C : 38...42 SLEEVE POSITION Overflow valve Control-lever position : 1 417 413 000 Degree: 49 Speed 17min: 600 Cont.-rod travelmm: 19,20...20.80 Inlet press., bar : 1.5 FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating nozzle-holder : 0 681 343 009 assembly 1st version Speed 4/min: 1050 Charge press. hPa: 700 Opening pressure, bar : 172...175 Del.quantity cm3/: 161,0...163,0 1000H: (158,0...166,0) cm3/: 4.0 1000H: (7,5) Test inj. tubing : 1 680 750 015 Dispersion Outside diameter x Wall thickness HIGHEST RATED SPEED x Length mm : 6,00x1,50x600 Setting point: 1/min : 600 (A) Injection pump setting values Contr.-rod trav.mm: 20,0 Insp. values in parentheses Set constant delivery quant. per values Testing: 1st c-rod trav.mm : 11,20 Speed 1/min: 1095...1110 START OF DELIVERY 2nd c-rod trav.mm : 4,00 Test pressure, bar: 25...27 Speed 1/min : 1150...1180 : 3,35...3,45 : (3,30...3,50) 1/min: 1300 4th speed Prestroke mm C-rod trav.mm : 0.00...1.00 Contr.-rod trav.mm: 9,00...12,00

K04

LOWEST RATED SPEED I Setting point w/out aux. spring 1/min : 300 Contr.-rod trav.mm: 6,50 Testing: 1/min : 100 Speed C-rod trav.mm min: 8.50 Speed 1/min: 300 : 6,50 C-rod trav.mm C-rod trav.mm : 2,00 1/min : 390...430 Speed TORQUE CONTROL Dimension a mm : 0,35 Torque-control curve - 1st version 1st speed 1/min : 1050 : 12,20...12,30 C-rod trav.mm 2nd speed 1/min: 600 C-rod trav.mm : 13,10...13,20 3rd speed 1/min : 900 C-rod trav.mm : 12,80...13,00 compensator (LDA,ADA,ALDA) 1st version Setting Speed 1/min : 500 Pressure hPa : 700 Contr.-rod trav.mm: 13,10...13,20 Measurement 1/min : 500 Speed 1st pressure hPa : 10,30...10,40 C-rod trav.mm 2nd pressure hPa : 400 : 12,40...12,50 : 250 C-rod trav.mm 3rd pressure hPa C-rod trav.mm : 11,10...11,30 SWITCH-OVER POINT 1/min : 230 (270) Speed FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 700 Speed 1/min: 600
Del, quantity cm3/: 177.0...181.0
1000H.: (174.0...184.0) Charge press. hPa : 700 Speed 1/min: 900 Del, quantity cm3/: 174,0...178,0 1000H.: (171,0...181,0) Charge press. hPa : -1/min : 500

Speed

K05

Del.quantity cm3/: 112,5...115,5 1000H.: (110,0...118.0)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 11,20

1/min: 1095...1110 Speed

STARTING FUEL DELIVERY

1/min : 100 Speed

Del.quantity cm3/: 150,0...170,0 1000H.: (-)

Contr.-rod trav.mm: 13,30...14,30

Remarks:

Note inst. in remarks column

Test sheet Test sheet : CAT 10.5 D Edition : 11.8.87 Superceeded : 10.85 Calibrating oil : ISO-4113

Combination no. : 9 400 087 321

Injection pump

Pump designation : PES6P80A720LS456 EP type number : 9 400 087 029

Governor

Governor design. : RQV350...1000PA755

: 9 420 080 197 Governer no.

Customer-spec. information

Customer : CATERPILLAR

: 3306 T Engine

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.5

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6,00X1,50X600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

: 1,65...1,75 Prestroke mm

: (1.60...1.80) Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5-3-6-2-4

Control-lever SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0,50 (0,75) position degrees: 66...75 Testing: SD mark cyl. no. : 1 1st c-rod trav.mm : 12,10 Speed 1/min: 1030...1040 BASIC SETTING 2nd c-rod trav.mm : 4,00 Speed 1/min: 1110...1140 4th speed 1/min: 1230 1st speed 1/mi: 1000 C-rod trav.mm : 0.00...1.00 Contr.-rod trav.mm: 13,10...13,20 LOWEST RATED SPEED I Del.quantity cm3/: 11,8...11,9 Control-lever position degrees: 13...21 100H.: (11,8...12,0) Testing: cm3/: 0,25 Dispersion Speed 1/min : 250 C-rod trav.mm min : 11,00 100H.: (0,40) Speed 1/min : 350 C-rod trav.mm : 5,90...6,10 C-rod trav.mm : 2,00 Speed 1/min : 510...570 2nd speed 1/min: 350 Contr.-rod trav. m: 6,70...6,90 Del.quantity cm3/: 0.9...1,6 100H.: (0,8...1,9) cm3/: 0.20 100H.: (0,35) CONSTANT REGULATION 1/min : 300...400 Dispersion Speed TORQUE CONTROL (B) Setting of injection pump with externally-mounted governor Dimension a mm : 1,30 Torque-control curve - 1st version 1st speed 1/min: 1000 C-rod trav.mm: 13,10...13,20 2nd speed 1/min: 600 SLEEVE TRAVELS 1st speed 1/min: 325 C-rod trav.mm : 14,40...14,50 3rd speed 1/min : 800 Sleeve travel mm: 0,50...2,00 2nd speed 1/min: 400 Sleeve travel mm: 2,70...3,10

3rd speed 1/min: 500

Sleeve travel mm: 3,50...4,20

4th speed 1/min: 800 C-rod trav.mm : 13,90...14,10 compensator (LDA, ADA, ALDA) Sleeve travel mm: 6,10...6,60 5th speed 1/min: 1010 1st version Sleeve travel mm: 8,50...8,60 Setting 1/min : 600 Speed SLEEVE POSITION Pressure hPa : 450 Contr.-rod trav.mm: 14,40...14,50 Control-lever position Degree: -1 1/min: 1010 Measurement Cont.-rod travelmm: 15,20...17,80 1/min: 600 Speed FULL-LOAD DELIV. AT FULL-LOAD STOP 1st pressure hPa : -: 13,00...13,10 C-rod trav.mm ist version 2nd pressure hPa : 270 C-rod trav.mm : 13,80...13,90 1/min: 1000 Speed Charge press. hPa: 450
Del.quantity cm3/: 118,5...119,5
1000H.: 118,0...120,0
Dispersion cm3/: 2,5 SWITCH-OVER POINT Speed 1/min: 290 (310) 1000H.: (4,0) FUEL-DELIVERY CHARACTERISTICS HIGHEST RATED SPEED 1st version

**K07** 

```
1st version
Charge press. hPa: 450
Speed
              1/min : 600
Del.quantity cm3/: 131.0...133.0
1000H.: (129.0...135.0)
Charge press. hPa: 450
Speed
             1/min : 800
Del.quantity cm3/: 127.5...129.5
1000H.: (125.5...131.5)
Charge press. hPa :
Speed
             1/min : 600
Del.quantity cm3/: 108,5...110,5
             1000H.: (106,5...112,5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 12,10 peed 1/min: 1030...1040
Speed
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 152,0...172,0
             1000H.: (-)
Contr.-rod trav.mm: 17,60...18,60
LOW IDLE
             1/min : 350
Speed
Contr.-rod trav.mm: 5,90...6,10
Remarks:
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Note inst. in remarks column

Test sheet : CAT 10,5 A1 : 11.8.87 : 10.85 : 180-4113 Edition Superceeded Calibrating oil

Combination no. : 9 400 087 322

Injection pump

Pump designation : PES6P80A720LS456 EP type number : 9 400 087 029

Governor

Governor design. : RQV350...950PA609-3 Governer no. : 9 420 080 198

Customer-spec. information

Customer : CATERPILLER

Engine : 3306 T

1st version kW : 103.0 Speed 1/min: 1900

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.5

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter x Wall thickness

: 6,00x1,50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 25...27

: 1,65...1,75 Prestroke mm

: (1,60...1,80) Contr.-rod trav.mm: 9,00...12,00

Cam sequence : 1-5-3-6-2-4 HIGHEST RATED SPEED 1st version Control-lever position degrees: 62...71 SD ang. spacing  $^{\circ}$ CS: 0-60-120-180-240-300 Tolerance + -  $^{\circ}$ : 0,50 (0,75) Testing: 1st c-rod trav.mm : 11,20 Speed 1/min: 980...990 SD mark cyl. no. : 1 2nd c-rod trav.mm: 4,00 1/min : 1050...1080 BASIC SETTING Speed 1/min : 1150 4th speed 1/mi: 950 C-rod trav.mm : 0,00...1,00 1st speed Contr.-rod trav.mm: 12,20...12,30 LOWEST RATED SPEED I Control-lever Del.quantity cm3/: 10,5...10,6 position degrees: 13...21 100H.: (11,3...11,7) Testing: 1/min : 250 Speed C-rod trav.mm min : 11.00 Dispersion cm3/:0,25Speed 1/min: 350 C-rod trav.mm: 5,90...6,10 C-rod trav.mm: 2,00 Speed 1/min: 510...570 100H.: (0,40) 1/min: 350 2nd speed Contr.-rod trav. m: 6,70...6,90 Del.quantity cm3/: 0.9...1.6 100H.: (0.7...1.8) Dispersion cm3/: 0.20 100H.: (0.35) CONSTANT REGULATION 1/min : 300...400 Speed TORQUE CONTROL Dimension a mm : 0,90 Torque-control curve - 1st version (B) Setting of injection pump with 1/min : 950 externally-mounted governor 1st speed C-rod trav.mm : 12,20...12,30 2nd speed 1/min: 500 SLEEVE TRAVELS 1st speed 1/min: 325 C-rod trav.mm : 13,10...13,20 Sieeve travel mm: 0,50...2,00 3rd speed 1/min : 700 2nd speed 1/min: 400
Sleeve travel mm: 2,70...3,10
3rd speed 1/min: 500 C-rod trav.mm : 13,00...13,20 4th speed 1/min : 800 C-rod trav.mm : 12,60...12,90 Steeve travel mm: 3,50...4,20 4th speed 1/min: 800 SWITCH-OVER POINT Sleeve travel mm: 6,10...6,60 5th speed 1/min: 1010 Sleeve travel mm: 8,40...8,60 1/min : 290 (310) Speed FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 500 Del.quantity cm3/: 108.0...110.0 1000H:: (107.0...111.0) SLEEVE POSITION Control-lever position Degree: -1 17min: 1010 1/min : 700 Speed Speed Cont.-rod travelmm: 15,20...17,80 Del.quantity cm3/: 111,0...113,0 1000H.: (110,0...114,0) FULL-LOAD DELIV. AT FULL-LOAD STOP ROTATIONAL-SPEED LIMITATION 1st version 1/min: 950 1st version Speed Del.quantity cm3/: 105.0...106.0 1000H.: (113,5...117,5) 1mm control-rod travel less than Dispersion cm3/: 2.5 1000H.: (4.0) full-load trav.mm: 11,20 1/min : 980...990 Speed

## STARTING FUEL DELIVERY

LOW IDLE

Speed 1/min: 350 Contr.-rod trav.mm: 5,90...6,10

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column

Test sheet : CAT 10,5 A2 Edition : 11.8.87 Superceeded : 10.85 Calibrating oil : ISO-4113

Combination no. : 9 400 087 324

Injection pump

Pump designation : PES6P80A720LS456 EP type number : 9 400 087 029 Governor

Governor design. : RQV350...1000PA609-4 Governer no. : 9 420 080 200

Customer-spec. information : CATERPILLAR Customer

: 3306 T Engine

1st version kW : 121.4 Speed 1/min: 2000

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.5

Calibrating nozzle-holder : 0 691 343 009 assembly

Opening pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter x Wall thickness

: 6,00x1,50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY Test pressure, bar: 25...27

: 1.65...1.75 : (1.60...1.80) Prestroke mm

Contr.-rod trav.mm: 9,00...12,00

```
Cam sequence : 1-5-3-6-2-4
                                                           Control-lever
                                                            position degrees: 66...75
                                                           Testing:
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0,50 (0,75)
                                                           1st c-rod trav.mm : 12.10
Speed 1/min : 1030...1040
                                                           2nd c-rod trav.mm : 4.00
Speed 1/min : 1110...1140
4th speed 1/min : 1230
SD mark cyl. no. : 1
BASIC SETTING
                                                              C-rod trav.mm : 0,00...1,00
              1/mi: 1000
1st speed
                                                           LOWEST RATED SPEED I
                                                           Control-lever
Contr.-rod trav.mm: 13,10...13,20
                                                            position degrees: 13...21
Del.quantity cm3/: 12,1...12,2
                                                           Testing:
                                                           Speed
                                                                         1/min : 250
                100H.: (12,1...12,3)
                                                           C-rod trav.mm min : 11,00
                                                           Speed 1/min: 350
C-rod trav.mm: 5,90...6,10
C-rod trav.mm: 2,00
Speed 1/min: 510...570
Dispersion
                cm3/:0,25
                100H.: (0,40)
                1/min: 350
                                                           CONSTANT REGULATION
2nd speed
Contr.-rod trav. m: 6,70...6,90
                                                                         1/min : 300...400
                                                           Speed
Del.quantity cm3/: 0.9...1.6
100H.: (0.8...1.9)
Dispersion cm3/: 0.20
100H.: (0.35)
                                                           TORQUE CONTROL
                                                           Dimension a mm : 0,90
                                                           Torque-control curve - 1st version
                                                                        1/min : 1000
                                                           1st speed
                                                              C-rod trav.mm : 13,10...13,20
(B) Setting of injection pump with
     externally-mounted governor
                                                           2nd speed 1/min: 500
                                                           C-rod trav.mm : 14,00...14,10
3rd speed 1/min : 700
SLEEVE TRAVELS
1st speed 1/min: 325
                                                             C-rod trav.mm : 13,90...14,10
  Sleeve travel mm: 0,50...2,00
                                                           4th speed 1/min : 850
2nd speed 1/min: 400
Sleeve travel mm: 2,70...3,10
                                                             C-rod trav.mm : 13.30...13.60
3rd speed 1/min: 500
                                                           SWITCH-OVER POINT
Sleeve travel mm: 3,50...4,20
4th speed 1/min: 800
                                                           Speed
                                                                        1/min : 290 (310)
Sleeve travel mm: 6,10...6,60
5th speed 1/min: 1010
                                                           FUEL-DELIVERY CHARACTERISTICS
  Sleeve travel mm: 8,40...8,60
                                                                         1/min : 500
                                                           Speed
                                                           Del.quantity cm3/: 122,5...124,5
1000H.: (120,5...126,5)
Speed 1/min: 700
SLEEVE POSITION
Speed
               1/min: 1010
Cont.-rod travelmm: 15,20...17,80
                                                           Del.quantity cm3/: 126,0...128,0
                                                                          1000H.: (124,0...130,0)
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                           ROTATIONAL-SPEED LIMITATION
1st version
Speed 1/min: 1000
Del.quantity cm3/: 121.5...122.5
1000H.: (121.0...123.0)
Dispersion cm3/: 2.5
                                                           1st version
                                                           1mm control-rod travel less than
                                                            full-load trav.mm: 12,10
Speed 1/min: 1030...1040
              1000H.: (4,0)
                                                           Speed
                                                           STARTING FUEL DELIVERY
HIGHEST RATED SPEED
1st version
```

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 5,90...6,10

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAT 10.5 A3 : 11.8.87 Edition Superceeded : 1.86 Calibrating oil : ISO-4113

: 9 400 087 325 Combination no.

Injection pump

: PES6P80A720LS456 Pump designation : 9 400 087 029 EP type number

Governor

Governor design. : RQV350...1000PA609-5 Governer no. : 9 420 080 201

Customer-spec. information

Customer : CATERPILLAR

: 3306 T Engine

1st version kW : 110.4 1/min: 2000 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.5

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter x Wall thickness

: 6,00X1,50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 25...27

: 1,65...1,75 Prestroke mm

: (1,60...1,80)

Contr.-rod trav.mm: 9,00...12,00

Cam sequence : 1-5-3-6-2-4 HIGHEST RATED SPEED 1st version Control-lever position degrees: 65...74 SD ang. spacing  $^{\circ}$  CS: 0-60-120-180-240-300 Tolerance + - : 0,50 (0,75) Testing: 1st c-rod trav.mm : 11.50 Speed 1/min : 1020...1030 SD mark cyl. no. : 1 2nd c-rod trav.mm : 4,00 Speed 1/min: 1090...1120 4th speed 1/min: 1220 BASIC SETTING 1st speed 1/mi: 990 C-rod trav.mm : 0,00...1,00 LOWEST RATED SPEED I Contr.-rod trav.mm: 12,50...12,60 Control-lever Del.quantity cm3/: 11,1...11,2 position degrees: 13...21 100H.: (10,9..,11,3) Testing: 1/min : 250 Speed C-rod trav.mm min: 11.00 Speed 1/min: 350 C-rod trav.mm: 5,90...6,10 C-rod trav.mm: 2,00 Speed 1/min: 510...570 cm3/:0.20Dispersion 100H.: (0,35) 2nd speed 1/min: 350 Contr.-rod trav. m: 6,70...6,90 Del.quantity cm3/: 0,9...1,6 100H.: (-) CONSTANT REGULATION Speed 1/min : 300...400 cm3/:0,20Dispersion 100H.: (0,30) TORQUE CONTROL Dimension a mm : 1,00 Torque-control curve - 1st version (B) Setting of injection pump with 1/min : 990 externally-mounted governor 1st speed C-rod trav.mm : 12,50...12,60 d speed 1/min : 500 SLEEVE TRAVELS 2nd speed C-rod trav.mm : 13,50...13,60 3rd speed 1/min : 700 1st speed 1/min: 325 Sleeve travel mm: 0,50...2,00 2nd speed 1/min: 400 C-rod trav.mm : 13,40...13,60 4th speed 1/min : 850 Sleeve travel mm: 2,70...3,10 3rd speed 1/min: 500 Sleeve travel mm: 3.50...4,20 4th speed 1/min: 800 C-rod trav.mm : 12,80...13,10 SWITCH-OVER POINT Sleeve travel mm: 6,10...6,60 5th speed 1/min: 1010 Speed 1/min : 290 (310) Sleeve travel mm: 8,40...8,60 FUEL-DELIVERY CHARACTERISTICS SLEEVE POSITION 1/min : 500 Del.quantity cm3/: 117.0...119.0 1000H.: (114.0...118.0) Speed 1/min: 700 Control-lever position Degree: -1 1/min: 1010 Speed Del.quantity cm3/: 114.5...116.5 1000H.: (113,5...117,5) Cont.-rod travelmm: 15,20...17,80 FULL-LOAD DELIV. AT FULL-LOAD STOP ROTATIONAL-SPEED LIMITATION 1st version 1/min: 990 1st version Speed Del.quantity cm3/: 111.0...112.0 1000H.: (109,5...113,5) 1mm control-rod travel less than Dispersion cm3/ : 2,0 full-load trav.mm: 11,50 1000H.: (3.5) Speed 1/min : 1020...1030

### STARTING FUEL DELIVERY

Speed 1/min: 100
Del.quantity cm3/: 152,0...172,0
1000H.: (-)
Gontr.-rod trav.mm: 17,60...18,60

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 5,90...6,10

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition Superceeded : CAT 7.0 B1 : 11.8.87 : 10.85 Calibrating oil : ISO-4113

: 9 400 087 326 Combination no.

Injection pump

Pump designation : PES4P80A720LS852 EP type number : 9 400 087 034

Governor

Governor design. : RQV350...1000PA609-5

Governer no. : 9 420 080 201

Customer-spec. information

Customer : CATERPILLAR

Engine : 3304 T

1st version kW : 78.7 1/min: 2000 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.5

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 1,5

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

: 6,00x1,50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1,65...1,75

: (1,60...1,80)

Contr.-rod trav.mm: 9,00...12,00

Cam sequence : 1-3-4-2 HIGHEST RATED SPEED 1st version Control-lever position degrees: 64...72 SD ang. spacing CS: 0-90-180-270 Tolerance + - 0,50 (0,75) Testing: 1st c-rod trav.mm : 11.20 Speed 1/min : 1030...1040 SD mark cyl. no. : 1 2nd c-rod trav.mm: 4,00 BASIC SETTING Speed 1/min : 1110...1140 4th speed 1/min: 1200 C-rod trav.mm : 0,00...1,00 1st speed 1/mi: 1000 Contr.-rod trav.mm: 12,20...12,30 LOWEST RATED SPEED I Control-lever Del.quantity cm3/: 10,6...10,7 position degrees: 13...21 100H.: (10,5...10,9) Testing: 1/min : 250 Speed C-rod trav.mm min : 11,50 Dispersion cm3/: 0.251/min : 350 C-rod trav.mm : 6.30...6.50 C-rod trav.mm : 2.00 Speed 1/min : 530...590 100H.: (0,35) 2nd speed 1/min: 350 Contr.-rod trav. m: 6,70...6,90 Del.quantity cm3/: 0,9...1,6 100H.: (0,7...1,8) CONSTANT REGULATION Speed 1/min: 320...420 cm3/: 0,20 Dispersion 100H.: (0,30) TORQUE CONTROL Dimension a mm : 1,00 Torque-control curve - 1st version (B) Setting of injection pump with 1st speed 1/min : 1000 externally-mounted governor C-rod trav.mm : 12.20...12,30 d speed 1/min : 500 SLEEVE TRAVELS 2nd speed C-rod trav.mm : 13,20...13,30 3rd speed 1/min : 700 1st speed 1/min: 325 Sleeve travel mm: 0,50...2,00 : 13,10...13,30 2nd speed 1/min: 400 C-rod trav.mm Sleeve travel mm: 2,70...3,10 4th speed 1/min: 850 3rd speed 1/min: 500 Sieeve travel mm: 3,50...4,20 4th speed 1/min: 800 C-rod trav.mm : 12,70...12,90 SWITCH-OVER POINT Sleeve travel mm: 6,10...6,60 5th speed 1/min: 1010 1/min : 290 (310) Speed Sleeve travel mm: 8,40...8,60 FUEL-DELIVERY CHARACTERISTICS 1/min : 500 SLEEVE POSITION Speed Del.quantity cm3/: 109.0...112.0 1000H:: (107.0...113.0) Speed 1/min: 700 Control-lever position Degree: -1 1/min: 1010 Speed Cont.-rod travelmm: 15,20...17,80 Del.quantity cm3/: 113,0...115,0 1000H.: (111.0...117.0) FULL-LOAD DELIV. AT FULL-LOAD STOP ROTATIONAL-SPEED LIMITATION 1st version Speed 1/min: 1000
Del.quantity cm3/: 106.5...107.5
1000H.: (105.0...109.0)
Dispersion cm3/: 2.5 1st version 1mm control-rod travel less than full-load trav.mm: 11,20 1000H.: (3.5) 1/min: 1030...1040 Speed

### STARTING FUEL DELIVERY

Speed 1/min: 100 Contr.-rod trav.mm: 17,60...18,60

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 6,30...6,50

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition : CAT 7.0 A1 Superceeded Calibration : 12.8.87 : 10.85 Calibrating oil : ISO-4113

Combination no. : 9 400 087 327

Injection pump

Pump designation : PES4P80A720LS440 EP type number : 9 400 087 028

Governor

Governor design. : RQV350...950PA609-6

Governer no. : 9 420 080 202

Customer-spec. information

Customer : CATERPILLAR

: 3304 - NA Engine

1st version kW : 65.5 1/min: 1900 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.5

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening.

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6,00X1,50X600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

: 1.95...2.05 : (1.90...2.10) Prestroke mm

Contr.-rod trav.mm: 9,00...12,00

Cam sequence : 1-3-4-2 HIGHEST RATED SPEED 1st version Control-lever position degrees: 62...71 SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0,50 (0,75) Testing: 1st c-rod trav.mm : 10,65 Speed 1/min : 980...990 SD mark cyl. no. : 1 2nd c-rod trav.mm : 4,00 1/min : 1055...1085 BASIC SETTING 4th speed 1/min: 1150 1st speed 1/mi: 950 C-rod trav.mm : 0,00...1,00 Contr.-rod trav.mm: 11,65...11,75 LOWEST RATED SPEED I Control-lever Del.quantity cm3/ : 9,0...9,1 position degrees: 15...23 100H.: (8,8...9,3) Testing: Speed 1/min : 250 Dispersion cm3/:0.25C-rod trav.mm min : 11,00 1/min : 350 Speed C-rod trav.mm : 6,30...6,50 C-rod trav.mm : 2,00 Speed 1/min : 540...600 100H.: (0,40) 1/min: 350 2nd speed Contr.-rod trav. m: 6,7...6,9 Del.quantity cm3/: 0,8...1,3 100H.: (0,6...1,4) CONSTANT REGULATION 1/min : 300...400 Speed cm3/:0,20Dispersion 100H.: (0,35) TORQUE CONTROL Dimension a mm : 0,80 (B) Setting of injection pump with Torque-control curve - 1st version 1/min : 950 externally-mounted governor 1st speed C-rod trav.mm : 11,65...11,75 1/min : 500 SLEEVE TRAVELS 2nd speed 1st speed 1/min: 325 C-rod trav.mm : 12,45...12,55 3rd speed 1/min: 700 Sleeve travel mm: 0,50...2,00 C-rod trav.mm : 12,35...12,55 4th speed 1/min : 800 2nd speed 1/min: 400 Sleeve travel mm: 2,70...3,10
3rd speed 1/min: 500
Sleeve travel mm: 3,50...4,20 C-rod trav.mm : 12,00...12,30 SWITCH-OVER POINT 4th speed 1/min: 800 Sleeve travel mm: 6.10...6.60 5th speed 1/min: 1010 1/min : 290 (310) Speed Sleeve travel mm: 8,40...8,60 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 500
Del.quantity cm3/: 95,5...97,5
1000H: (93,5...99,5)
Speed 1/min: 700 SLEEVE POSITION Control-lever position Degree: -1 17min: 1010 Speed Del.quantity cm3/: 100,0...102,0 Cont.-rod travelmm: 15,20...17,80 1000H.: (98,0...104,0) FULL-LOAD DELIY. AT FULL-LOAD STOP ROTATIONAL-SPEED LIMITATION 1st version 1/min: 950 1st version Speed Del.quantity cm3/: 90.5...91.5 1000H.: (88,5...93,5) 1mm control-rod travel less than Dispersion cm3/ : 2,5 full-load trav.mm: 10,65 1000H.: (4,0) 1/min : 980...990 Speed

#### STARTING FUEL DELIVERY

LOW IDLE

Speed 1/min: 350 Contr.-rod trav.mm: 6,30...6,50

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet Edition Superceeded : CAT 7.0 A2 : 12.8.87 : 10.85 Calibrating oil : ISO-4113 Combination no. : 9 400 087 328 Injection pump Pump designation : PES4P80A720LS440 EP type number : 9 400 087 028 Governor Governor design. : RQV350...1000PA613-2 Governer no. : 9 420 080 203 Customer-spec. information : CATERPILLAR Customer Engine : 3304 NA 1st version kW : 58.8 1/min: 2000 Speed TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. C : 38...42 Overflow valve : 1 417 413 000 Inlet press., bar: 1.5 Calibrating nozzle-holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test inj. tubing : 1 680 750 015 Outside diameter x Wall thickness : 6,00X1,50X600 x Length mm (A) Injection pump setting values

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1,95...2,05 : (1,90...2,10) Contr.-rod trav.mm: 9,00...12,00

Cam sequence : 1-3-4-2 HIGHEST RATED SPEED 1st version Control-lever position degrees: 66...75 SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0,50 (0,75) Testing: 1st c-rod trav.mm : 10,60 Speed 1/min: 1030...1040 SD mark cyl. no. : 1 2nd c-rod trav.mm: 4.00 Speed 1/min: 1100...1130 4th speed 1/min: 1180 BASIC SETTING 1/mi: 1000 C-rod trav.mm : 0.00...1.00 1st speed Contr.-rod trav.mm: 11,60...11,70 LOWEST RATED SPEED I Control-lever Del.quantity cm3/ : 9,0...9.1 position degrees: 17...25 100H.: (8,8...9,34 Testing: 1/min : 250 Speed Dispersion cm3/:0.25C-rod trav.mm min: 11,00 Speed 1/min: 350 C-rod trav.mm : 6,50...6,70 C-rod trav.mm : 2,00 Speed 1/min: 550...610 100H.: (0,40) 2nd speed 1/min: 350 Contr.-rod trav. m: 6,70...6,90 Del.quantity cm3/: 0.8...1.2 100H.: (0.7...1.3) CONSTANT REGULATION 1/min : 300...400 Speed cm3/: 0.20 100H: (0.35) Dispersion TORQUE CONTROL Dimension a mm : 0,50 Torque-control curve - 1st version (B) Setting of injection pump with externally-mounted governor 1st speed 1/min: 1000 C-rod trav.mm : 11,60...11,70 2nd speed 1/min: 500 SLEEVE TRAVELS 1st speed 1/min: 325 C-rod trav.mm : 12,10...12,20 Sleeve travel mm: 0,50...2,00 3rd speed 1/min : 700 C-rod trav.mm : 12,00...12,20 4th speed 1/min : 850 2nd speed 1/min: 400 Sleeve travel mm: 2,70...3,10 3rd speed 1/min: 500 Sleeve travel mm: 3.50...4,20 4th speed 1/min: 800 C-rod trav.mm : 11,70...12,00 SWITCH-OVER POINT Sleeve travel mm: 6,10...6,60 5th speed 1/min: 1010 Speed 1/min : 290 (310) Sleeve travel mm: 8,40...8,60 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 500
Del.quantity cm3/: 90.0...92.0
1000H.: (87.5...94.5)
Speed 1/min: 700 SLEEVE POSITION Control-lever position Degree: -1 17min: 1000 Speed Del.quantity cm3/: 95,0...97,0 Cont.-rod travelmm: 15,20...17,80 1000H.: (92,5...99,5) FULL-LOAD DELIV. AT FULL-LOAD STOP ROTATIONAL-SPEED LIMITATION 1st version 1/min: 1000 1st version Speed Del.quantity cm3/: 90.0...91.0 1000H: (88.0...93.0/ Dispersion cm3/: 2.5 1000H: (4.0) 1mm control-rod travel less than full-load trav.mm: 10,60 Speed 1/min: 1030...1040

# STARTING FUEL DELIVERY

LOW IDLE

Speed 1/min: 350 Contr.-rod trav.mm: 6,50...6,70

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 6.6 C Edition : 12.8.87 Superceeded : 4.86 Calibrating oil : ISO-4113

Combination no. : 9 400 087 334

Injection pump

Pump designation : PES6P110A720RS3149

EP type number : 9 400 087 045

Governor

Governor design. : RQV350...1300PA772

Governer no. : 9 420 080 209

Customer-spec. information

: FORD (FTO) Customer

Engine : 6.6 L TC

1st version kW : 121.4 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.5

Calibrating nozzle-holder

assembly : 1 688 901 017

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0,6

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6,00X2,00X600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4,25...4,35 Control-lever : (4,20...4,40) position degrees: 61...69 Contr.-rod trav.mm: 9,00...12,00 Cam sequence : 1-5-3-6-2-4 Testing: 1st c-rod trav.mm : 12,10 Speed 1/min : 1360...1370 2nd c-rod trav.mm : 4,00 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0,5 (0,75) Speed 1/min: 1505...1535 4th speed 1/min: 1650 C-rod tray.mm : 0.00...1.00 SD mark cyl. no. : 1 LOWEST RATED SPEED I BASIC SETTING Control-lever position degrees: 9...17 1st speed 1/mi: 1300 Testing: Contr.-rod trav.mm: 13,10...13,20 1/min : 100 Speed C-rod trav.mm min : 9,00 Speed 1/min: 350 Del.quantity cm3/ : 10,5...10,7 C-rod trav.mm : 7,20...7,40 C-rod trav.mm : 2,00 100H.: (10,2...11,0) 1/min : 600...660 Speed cm3/ : 0,50 Dispersion CONSTANT REGULATION 100H.: (0,90) 1/min : 370...440 Speed (B) Setting of injection pump with compensator (LDA, ADA, ALDA) externally-mounted governor SLEEVE TRAVELS 1st version 1st speed 1/min: 350 Setting Sleeve travel mm: 0.60...1.30 2nd speed 1/min: 500 Sleeve travel mm: 2.30...2.70 Speed 1/min: 500 Pressure hPa: 1000 Contr.-rod trav.mm: 13,10...13,20 3rd speed 1/min: 800 Steeve travel mm: 4.00...4.30
4th speed 1/min: 1000
Steeve travel mm: 5.00...5.30
5th speed 1/min: 1300
Steeve travel mm: 7.20...7.30 Measurement 1/min : 500 Speed 1st pressure hPa : (-) C-rod trav.mm : 11,60...11,70 2nd pressure hPa : 700 C-rod trav.mm : 12,70...12,80 3rd pressure hPa : 500 SLEEVE POSITION Control-lever position C-rod trav.mm : 12,00...12,20 Degree: -1 1/min: 1350 Speed SWITCH-OVER POINT Cont.-rod travelmm: 15,20...17,80 FULL-LOAD DELIV, AT FULL-LOAD STOP Speed 1/min : 290 (310) FUEL-DELIVERY CHARACTERISTICS 1st version Speed 1/min: 1300 Charge press. hPa: 1000
Del.quantity cm3/: 105.0...107.0
1000H.: (102.0...110.0)
Dispersion cm3/: 5.0
1000H.: (9.0) 1st version Charge press. hPa : 1000 Speed 1/min: 800 Del.quantity cm3/: 102.0...106.0 1000H.: (100.0...108.0) HIGHEST RATED SPEED Charge press. hPa : (-) Speed 1/min : 500 1st version

```
Del.quantity cm3/: 76,5...78,5
1000H.: (73,5...81,5)

ROTATIONAL-SPEED LIMITATION

1st version
1mm control-rod travel less than

full-load trav.mm: 12,10
Speed 1/min: 1360...1370

STARTING FUEL DELIVERY

Speed 1/min: 100
Del.quantity cm3/: 100,0...120.0
1000H.: (96,0...124,0)
Contr.-rod trav.mm: 20,00...21,00

LOW IDLE

Speed 1/min: 350
Contr.-rod trav.mm: 7,20...7,40
Del.quantity cm3/: 16,0...20,0
1000H.: (13,5...22,5)
Dispersion cm3/: 3,5
1000H.: (5,5)
Set shutoff stop 1.5...2.0 mm before shutoff.
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     Prestroke mm
                                                                         : 4,25...4,35
                                                                         : (4,20...4,40)
Note inst. in remarks column
                                                     Contr.-rod trav.mm: 9,00...12,00
                                                     Cam sequence : 1-5-3-6-2-4
Test sheet
                   : FOR 7,8 B
Edition
                   : 12.8.87
Superceeded
                   : 10.85
                                                     SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Calibrating oil
                  : ISO-4113
                   : 9 400 087 338
Combination no.
                                                     SD mark cyl. no. : 1
Injection pump
Pump designation : PES6P110A720RS3151
                                                     BASIC SETTING
EP type number : 9 400 087 047
                                                                    1/mi: 1300
Governor
                                                     1st speed
Governor design. : RQV350...1300PA777
Governer no. : 9 420 080 211
                                                     Contr.-rod trav.mm: 14,10...14,20
                                                     Del.quantity cm3/: 14,4...14,6
Customer-spec. information
                   : FORD (FTO)
Customer
                                                                   100H.: (14,2...14,8)
                   : 7.8 L-TC
Engine
                                                     Dispersion
                                                                   cm3/: 0,50
1st version kW : 165.6
                                                                   100H.: (0,90)
              1/min: 2600
Speed
TEST BENCH REQUIREMENTS
                                                     (B) Setting of injection pump with
                                                         externally-mounted governor
Calibrating-oil inlet temp. C
                   : 38...42
                                                     SLEEVE TRAVELS
                                                     1st speed 1/min: 350
                                                       Sleeve travel mm: 0,60...1,30
Overflow valve
                                                     2nd speed 1/min: 500
Sleeve travel mm: 2,30...2,70
3rd speed 1/min: 800
                   : 1 417 413 025
Inlet press., bar : 1.5
                                                       Sleeve travel mm: 4,00...4,30
                                                     4th speed 1/min: 1000
Calibrating nozzle-holder
                                                       Sleeve travel mm: 5,00...5,30
 assembly
              : 1 688 901 017
                                                     5th speed 1/min: 1300
                                                       Sleeve travel mm: 7,20...7,30
Opening
pressure, bar : 207...210
                                                     SLEEVE POSITION
                                                     Control-lever position
Perforated-plate
                   : 0,6
                                                                  Degree: -1
 diameter mm
                                                                   17min: 1350
                                                     Speed
                                                     Cont.-rod travelmm: 15,20...17,80
Test inj. tubing : 1 680 750 015
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Outside diameter
x Wall thickness
                                                     1st version
                                                     Speed
                                                                   1/min: 1300
                   : 6,00x1,50x600
x Length mm
                                                     Charge press. hPa : 800
                                                     Del.quentity cm3/: 144.5...146.5
1000H:: (142.5...148.5)
Dispersion cm3/: 5.0
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                                  1000H.: (9,0)
    per values
                                                     HIGHEST RATED SPEED
START OF DELIVERY
Test pressure, bar: 25...27
                                                     1st version
```

L02

Control-lever position degrees: 61...69 Testing: 1st c-rod trav.mm : 13,10 1/min: 1360...1370 Speed 2nd c-rod trav.mm : 4,00 1/min: 1510...1540 Speed 1/min: 1630 4th speed C-rod trav.mm : 0,00...1,00 LOWEST RATED SPEED I Control-lever position degrees: 11...19 Testing: 1/min : 100 Speed C-rod trav.mm min : 9,00 mm min : 350 mm : 7,40...7,60 mm : 2,00 Speed C-rod trav.mm C-rod trav.mm 1/min : 620...680 Speed CONSTANT REGULATION 1/min : 370...440 Speed compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 Speed hPa : 800 Pressure Contr.-rod trav.mm: 13,80...13,90 Measurement 1/min : 500 Speed 1st pressure hPa : (-) : 12,10...12,20 : 580 C-rod trav.mm 2nd pressure hPa C-rod trav.mm : 13,70...13,80 3rd pressure hPa : 390 C-rod trav.mm : 12,60...12,80 SWITCH-OVER POINT 1/min : 290 (310) Speed FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa: 800 1/min : 800 Speed Del.quantity cm3/: 119.0...123.0 1000H.: (117.0...125.0) shutoff.

Del.quantity cm3/: 73,0...75,0 1000H.: (70.0...78.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 13,10 1/min : 1360...1370 Speed STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 150,0...170,0 1000H.: (146,0...174,0) Contr.-rod trav.mm: 20,0...21,0 LOW IDLE 1/min : 350 Speed

Contr.-rod trav.mm: 7,40...7,60 Del.quantity cm3/: 16.0...20.0 1000H.: (13,5...22,5) cm3/: 3.5 1000H.: (5.5) Dispersion Set shutoff stop 1.5...2.0 mm before

Speed

Charge press. hPa : -

1/min : 500

```
: 3.95...4.05
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Prestroke mm
                                                                          : (3.90...4.10)
                                                      Contr.-rod trav.mm: 9.00...12.00
Note inst. in remarks column
                                                      Cam seguence : 1-5- 3- 6- 2-
Test sheet
                   : CAT 10,5 J
                    : 24.07.87
Edition
Superceeded
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Calibrating oil : ISO-4113
Combination no.
                   : 9 400 087 348
                                                      SD mark cyl. no. : 1
Injection pump
Pump designation : PES6P100A720LS508
                                                      BASIC SETTING
EP type number : 9 400 087 053
Governor
                                                      1st speed
                                                                    1/mi: 875
Governor design. : RQV350...875PA798-6
Governer no.
                                                      Contr.-rod trav.mm: 8.80...8.90
                   : 9 420 080 236
                                                      Del.quantity cm3/ : 7.1...7.3
Customer-spec. information
Customer
                   : CATERPILLAR
                                                                     100H.: (6.9...7.5)
                   : 3306 DINA
Engine
                                                                     cm3/: 0.3
                                                      Dispersion
1st version kW
                  : 87.2
Speed
              1/min: 1750
                                                                     100H.: (0.6)
                                                                     1/min: 350.0
TEST BENCH REQUIREMENTS
                                                      2nd speed
                                                      Contr.-rod trav. m: 6.7...6.9
Calibrating-oil inlet temp. °C
                                                      Del.quantity cm3/: 1.0...1.4
                                                                    100H.: (0.7...1.6)
cm3/: 0.3
100H.: (0.5)
                   : 38...42
                                                      Dispersion
Overflow valve
                    : 9 401 087 348
                                                      (B) Setting of injection pump with
                                                           externally-mounted governor
Inlet press., bar : 2.00
                                                      SLEEVE TRAVELS
Calibrating nozzle-holder
                                                      1st speed 1/min: 350
Sleeve travel mm: 1.90...2.70
2nd speed 1/min: 450
Sleeve travel mm: 3.80...4.20
                   : 1 688 901 017
 assembly
Opening
 pressure, bar
                   : 207...210
                                                                   1/min: 650
                                                      3rd speed
Perforated-plate
                                                        Sleeve travel mm: 5.60...6.00
                                                      4th speed 1/min: 920
                    : 0.6
 diameter mm
                                                        Sleeve travel mm: 8.50...8.60
                                                      SLEEVE POSITION
Test inj. tubing
                   : 1 680 750 008
                                                      Control-lever position
                                                                   Degree: -1
1/min: 950
Outside diameter
x Wall thickness
                                                      Cont.-rod travelmm: 15.20...17.80
                    : 6.00x2.00x600
x Length mm
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                      1st version
                                                      Speed 1/min: 875
Del.quantity cm3/: 71.5...73.5
    per values
                                                                   1000H.: (69.5...75.5)
cm3/ : 3.50
1000H.: (6.00)
START OF DELIVERY
Test pressure, bar: 2...3
                                                      Dispersion
L04
```

HIGHEST RATED SPEED 1st version Control-lever position degrees: 61...69 Testing: 1st c-rod trav.mm: 7.80 1/min: 910...920 Speed 2nd c-rod trav.mm : 4.00 1/min: 950...980 Speed 1/min : 1050 4th speed C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 11...19 Testing: 1/min : 100 Speed C-rod trav.mm min: 8.00 1/min: 350 mm: 5.10...5.30 mm: 2.00 Speed C-rod trav.mm C-rod trav.mm 1/min : 420...480 Speed CONSTANT REGULATION 1/min : 350...420 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min: 875 C-rod trav.mm : 8.80...8.90 1/min : 600 2nd speed C-rod trav.mm : 9.50...8.60 3rd speed 1/min: 700 C-rod trav.mm : 9.20...9.40 4th speed 1/min: 750 C-rod trav.mm : 9.00...9.30 SWITCH-OVER POINT 1/min : 290 (310) Speed FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 600
Del.quantity cm3/: 70.0...74.0
1000H.: (68.0...76.0)
Dispersion cm3/: 5.00
1000H.: (7.60)
Speed 1/min: 750 Del.quantity cm3/: 70.5...74.5 1000H.: (68.5...76.5)

ROTATIONAL-SPEED LIMITATION

full-load trav.mm: 7.80

1mm control-rod travel less than

1st version

L05

Speed 1/min : 910...920

STARTING FUEL DELIVERY

LOW IDLE

Speed 1/min: 350 Contr.-rod trav.mm: 5.10...5.30

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAT 10.5 I : 24.07.87

Superceeded

Calibrating oil : ISO-4113

Combination no. : 9 400 087 356

Injection pump

Pump designation : PES6P100A720LS511 : 9 400 087 059

EP type number

Governor : RQV350/840...900 Governor design.

PA839

: 9 420 080 233 Governer no.

Customer-spec. information Customer : CATERPILLAR

: 3306 DIT Engine

1st version kW : 190.0 1/min: 1800 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 9 401 087 348

Inlet press., bar : 2.00

Calibrating nozzle-holder assembly : 1 688 901 017

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.6

Test inj. tubing : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 2...3

```
Del.quantity cm3/: 182.5...184.5
                     : 2.80...2.90
                                                                      1000H.: (180.0...187.0)
Prestroke mm
                                                                      cm3/ : 3.50
                    : (2.75...2.95)
                                                        Dispersion
Contr.-rod trav.mm: 9.00...12.00
                                                                      1000H.: (6.00)
Cam sequence : 1-5-3-6-2-4
                                                        HIGHEST RATED SPEED
                                                        1st version
                                                        Control-lever
SD ang. spacing ^{0}CS: 0-60-120-180-240-300 Tolerance + - ^{0}: 0.50 (0.75)
                                                         position degrees: 57...65
                                                        Testing:
SD mark cyt. no. : 1
                                                        1st c-rod trav.mm : 11.60
                                                          Speed 1/min: 910...920
BASIC SETTING
                                                        2nd c-rod trav.mm : 4.00
                                                          Speed 1/min: 930...960
                1/mi: 900
                                                                      1/min : 1050
1st speed
                                                        4th speed
                                                          C-rod trav.mm : 0.00...1.00
Contr.-rod trav.mm: 12.60...12.70
                                                        LOWEST RATED SPEED I
Del.quantity cm3/: 18.2...18.4
                                                        Control-lever
                                                         position degrees: 5...13
               100H.: (18.0...18.7)
                                                        Testing:
                                                                      1/min : 100
Dispersion
               cm3/ : 0.3
                                                        Speed
                                                        C-rod trav.mm min: 7.00
                                                                     1/min : 350
               100H.: (0.6)
                                                        Speed
                                                        C-rod trav.mm : 4.70...4.90
C-rod trav.mm : 2.00
               1/min: 350.0
2nd speed
Contr.-rod trav. m: 6.4...6.6

Del.quantity cm3/: 1.3...1.7

100H.: (1.0...1.9)

Dispersion cm3/: 0.3
                                                                     1/min : 770...830
                                                        Speed
                                                        SWITCH-OVER POINT
               100H.: (0.5)
                                                                     1/min : 290 (310)
                                                        Speed
                                                        ROTATIONAL-SPEED LIMITATION
(B) Setting of injection pump with
    externally-mounted governor
                                                        1st version
SLEEVE TRAVELS
                                                        1mm control-rod travel less than
1st speed 1/min: 350
Sleeve travel mm: 0.50...1.50
                                                         full-load trav.mm: 11.60
2nd speed 1/min: 500
                                                                      1/min: 910...920
                                                        Speed
Sleeve travel mm: 2.40...2.60 3rd speed 1/min: 750
                                                        STARTING FUEL DELIVERY
Sleeve travel mm: 2.40...2.60
4th speed 1/min: 850
Sleeve travel mm: 4.00...4.50
5th speed 1/min: 950
                                                                      1/min : 100
                                                        Speed
                                                        Del.quantity cm3/: 195.0...215.0
1000H.: (191.0...219.0)
  Sleeve travel mm: 8.50...8.60
                                                        Contr.-rod trav.mm: 14.00...15.00
SLEEVE POSITION
                                                        LOW IDLE
Control-lever position
             Degree: -1
                                                        Speed 1/min: 350
Contr.-rod trav.mm: 4.70...4.90
               17min: 925
Cont.-rod travelmm: 15.20...17.80
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                        Remarks:
1st version
              1/min: 900
Speed
```

BOSCH INJ. PUMP TEST SPECIFICATIONS 270-315 Tolerance + - 0 : 0,59 (0,75) Note inst. in remarks column BASIC SETTING : DEE 15.6 F : 17.8.87 Test sheet Edition 1st speed 1/mi: 1050 Superceeded : ISO-4113 Contr.-rod trav.mm: 10,00 Calibrating oil : 9 400 231 128 Combination no. Del.quantity cm3/: 14,7...14,9 Injection pump 100H.: (-) Pump designation : PES8P110A120R\$3111 Governor Dispersion cm3/:0,4: RSV400...1050P2/435 Governor design. 100H.: (-) Customer-spec. information Customer : JOHN DEERE 1/min: 400 2nd speed Contr.-rod trav. m: 5,20 Del.quantity cm3/: 2,2...2,8 100H:: (-) : 8955 T Engine TEST BENCH REQUIREMENTS cm3/: 0,4 100H.: (-) Dispersion Calibrating-oil inlet temp. OC : 40...45 SLEEVE POSITION Control-lever position Overflow valve Degree: -3 1/min: 800 : 1 457 413 010 Speed Cont.-rod travelmm: 0,30...1,70 Inlet press., bar : 1.5 FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating nozzle-holder : 0 681 343 009 assembly 1st version 1/min: 1050 Speed Charge press. hPa : 670 Opening Del.quantity cm3/: 147,0...149,0 1000H.: (-) pressure, bar : 172...175 HIGHEST RATED SPEED Test in i. tubing : 1 680 750 015 1st version Outside diameter Control-lever x Wall thickness position degrees: 39,5...47,5 x Length mm : 6,00x3,00x600 Testing: (A) Injection pump setting values 1st c-rod trav.mm : 9,00 Insp. values in parentheses Set constant delivery quant. 1/min : 1095...1105 Speed 2nd c-rod trav.mm : 4.00 Speed 1/min : 1155...1185 per values 1/min : 1275 4th speed : 0,30...1,70 START OF DELIVERY C-rod trav.mm : 3,45...3,55 : (3,40..,3,60) Prestroke mm LOWEST RATED SPEED I Control-lever Contr.-rod trav.mm: 10,50 position degrees: 17...25 : 1-5-6-3-4-2-7-8 Setting point w/out aux. spring Cam sequence 1/min : 400 Contr.-rod trav.mm: 4,70 SD ang. spacing CS: 0-45-90-135-180-225-Testing: Speed 1/min : 100

L09

C-rod trav.mm min : 16,00 1/min : 400 Speed : 5,10...5,30 C-rod trav.mm C-rod trav.mm : 2,00 1/min : 565...625 Speed 1/min : 800 Speed C-rod trav.mm max : 1,00 TORQUE CONTROL Torque-control curve - 1st version 1/min : 1050 1st speed C-rod trav.mm : 9,95...10,05 2nd speed 1/min : 750 C-rod trav.mm : 10,85...11,15 3rd speed 1/min : 550 G-rod trav.mm : 9,45...9,55 compensator (LDA,ADA,ALDA) 1st version Setting 1/mie : 500 hPa : 390 Speed Pressure Contr.-rod tray.mm: 10,65...10,75 Measurement Speed 1/min : 500 1st pressure hPa : 280 C-rod trav.mm : 9,70...9,90 SWITCH-OVER POINT 1/min : 400...700 Speed FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 670 Speed 1/min : 750 Del.quantity cm3/ : 163,5...166,5 1000H.: (-) Charge press. hPa : -1/min : 550 Speed Del.quantity cm3/: 130,0...134,0 1000H.: (-) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 9,00 1/min: 1095...1105 Speed

1/min : 100 Speed Del.quantity cm3/: 180,0...200,0

1000H.: (-)

HIGH IDLE

1/min: 1155 Speed Del.quantity cm3/: 37,0...47,0 1000H.: (-)

LOW IDLE

1/min : 400 Speed

Contr.-rod trav.mm: 22,0...28,0

Del.quantity cm3/: (-)

Remarks:

STARTING FUEL DELIVERY

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : SCA 11,0 V8 : 12.8.87 Edition Superceeded Calibrating oil : ISO-4113 : 9 400 087 373 Combination no. Injection pump Pump designation : PE6P120A720RS7004 EP type number : 0 412 626 801 Governor Governor design. : RSV350...1050P1/481 Governer no. : 9 420 082 322 Customer-spec. information Customer : SCANIA : DS11 Engine TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.5 Calibrating nozzie-holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Perforated-plate diameter mm : 0,8 Test inj. tubing : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6,00x1,50x600 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values START OF DELIVERY Test pressure, bar: 25...27 : 5,00...5,10 : (4,95...5,15) Prestroke mm Contr.-rod trav.mm: 9,00...12,00

Cam sequence : 1-5-3-6-2-4 SD ang. spacing  $^{\circ}$ CS: 0-60-120-180-240-300 Tolerance + - : 0,5 (0,75) SD mark cyl. no. : 1 BASIC SETTING 1/mi: 1050 1st speed Contr.-rod trav.mm: 12,80...12,90 Del.quantity cm3/: 21,5...21,7 100H.: (21,2...22,0) Dispersion cm3/:0.60100H.: (0,90) SLEEVE POSITION Control-lever position Degree: -3 1/min: 800 Cont.-rod travelmm: 0.30...1.40 Governor-spring reload Notch setting x : 6,0 FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version 1/min: 1050 Speed Del.quantity cm3/: 212,5...217,5 1000H.: (212,5...220,5) Dispersion cm3/: 6,0 1000H.: (9,0) HIGHEST RATED SPEED 1st version Control-lever position degrees: 50...58 Testing: 1st c-rod trav.mm : 11,80 Speed 1/min: 1090...1100 2nd c-rod trav.mm : 4,00 1/min : 1170...1200 4th speed 1/min : 1250 C-rod trav.mm : 0.30...1.70 LOWEST RATED SPEED I Control-lever position degrees: 20...28 Setting point w/out aux. spring Speed 1/min : 350

Speed 1/min: 350 C-rod trav.mm: 5,50 C-rod trav.mm: 2,00 Speed 1/min: 420...480

FUEL-DELIVERY CHARACTERISTICS

1/min : 500 Speed

Del.quantity cm3/: 208.0...220.0 1000H.: (206.0...222.0)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 11,80

1/min : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 240,0...290,0 1000H.: (-) Contr.-rod trav.mm: 20,00...21,00

LOW IDLE

1/min : 350 Contr.-rod trav.mm: 5,40...5,60

Del.quantity cm3/: 12,0...18,0 1000H.: (9,0...21,0) Dispersion cm3/: 8,0 1000H.: (12,0)

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

Contr.-rod trav.mm: 5.00

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                        SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0,5 (0,75)
Note inst. in remarks column
Test sheet
                     : KHD 6,1 A4
                     : 12.8.87
Edition
                                                        SD mark cyl. no. : 1
                    : 12.85
Superceeded
Calibrating oil : ISO-4113
                                                        BASIC SETTING
Combination no.
                    : 9 400 093 227
                                                        1st speed
                                                                        1/mi: 1150
Injection pump
                                                        Contr.-rod trav.mm: 11,30...11,40
Pump designation : PES6A85D410RS2415
EP type number
                     : 9 400 093 006
                                                        Del.quantity cm3/ : 7,2...7,3
Governor
                    : RSV325...1150A1B
                                                                       100H.: (7,0...7,5)
Governor design.
                       1111L
                    : 9 420 C92 009
Governer no.
                                                        Dispersion
                                                                       cm3/:0.30
                                                                       100H.: (0,50)
Customer-spec. information
Customer
                     : DEUTZ ARG.
                                                        2nd speed 1/min: 325
Contr.-rod trav. m: 7,90...8,10
Del.quantity cm3/: 0.9...1,3
                     : BF6L913
Engine
                                                                       100H.: (0,7...1,5)
TEST BENCH REQUIREMENTS
                                                                       cm3/: 0.25
                                                        Dispersion
Calibrating-oil inlet temp. OC
                                                                       100H.: (0.45)
                     : 38...42
                                                        SLEEVE POSITION
Overflow valve
                                                        Control-lever position
                                                                      Degree: -3
1/min: 800
                     : 1 417 413 000
                                                        Speed
                                                        Cont.-rod travelmm: 0.30...1.00
Inlet press., bar: 1.0
Calibrating nozzle-holder
                                                        Governor-spring reload
                   : 0 681 343 009
                                                        Notch setting x : 5,0
 assembly
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
pressure, bar : 172...175
                                                        1st version
                                                                       1/min: 1150
                                                        Speed
                                                        Del.quantity cm3/: 72.5...73.5
1000H:: (70.5...75.5)
Dispersion cm3/: 3.0
Test inj. tubing : 1 680 750 003
Outside diameter
x Wall thickness
                                                                      1000H.: (5.0)
                    : 6,00x2,00x600
x Length mm
                                                        HIGHEST RATED SPEED
(A) Injection pump setting values
                                                        1st version
    Insp. values in parentheses
Set constant delivery quant.
                                                        Control-lever
                                                         position degrees: 56...64
    per values ____
                                                        Testing:
                                                        1st c-rod trav.mm : 10,30
Speed 1/min : 1190...1200
START OF DELIVERY
Test pressure, bar: 25...27
                                                        2nd c-rod trav.mm : 4.00
Speed 1/min : 1220...1250
                    : 1,90...2,00
: (1,85...2,05)
Prestroke mm
                                                                    1/min : 1350
                                                        4th speed
Contr.-rod trav.mm: 9,00...12,00
                                                                             : 0,30...1,70
                                                          C-rod trav.mm
Cam sequence : 1-5-3-6-2-4
                                                        LOWEST RATED SPEED I
L13
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Control-lever position degrees: 23...31 Setting point w/out aux. spring 1/min : 325 Contr.-rod trav.mm: 7,50 Testing: 1/min : 100 Speed C-rod trav.mm min : 19,00 1/min : 325 Speed C-rod trav.mm : 8.00 nm : 2,00 1/min : 540...610 C-rod trav.mm Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1150 C-rod trav.mm : 11,30...11,40 2nd speed 1/min : 500 C-rod trav.mm : 13,00...13,10 3rd speed 1/min : 800 C-rod trav.mm : 12,20...12,50 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 500
Del.quantity cm3/: 78,5...80,5
1000H: (76,0...83,0)
Speed 1/min: 800 Del.quantity cm3/: 75.5...77.5 1000H:: (73.0...80.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10,30 1/min : 1190...1200 Speed STARTING FUEL DELIVERY 1/min : 100 Speed Contr.-rod trav.mm: 19,00...21,00 Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS BASIC SETTING Note inst. in remarks column 1st speed 1/mi: 1080 : DEE 7,6 V Test sheet : 17.8.87 Edition Contr.-rod trav.mm: 10,20 Superceeded Calibrating oil : ISO-4113 Del.quantity cm3/: 9,5...9,7 : 9 400 230 007 100H.: (-) Combination no. Injection pump Dispersion cm3/: 0.30Pump designation : PES6A95D41ORS2560 Governor 100H.: (-) : RSV400...1100A7B Governor design. 2044L 1/min: 400 2nd speed Contr.-rod trav. m: 5,80 Del.quantity cm3/: 1,2...1,6 100H.: (-) Customer-spec. information : JOHN DEERE Customer Engine : 6466 T SLEEVE POSITION Control-lever position TEST BENCH REQUIREMENTS Degree: -3 17min: 800 Speed Calibrating-oil inlet temp. °C Cont.-rod travelmm: 0,30...0,70 : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 413 385 007 1st version 1/min: 1080 Speed Del.quantity cm3/: 95.0...97.0 1000H.: (93.0...99.0) Inlet press., bar : 1.5 Calibrating nozzle-holder : 0 681 343 009 assembly HIGHEST RATED SPEED 1st version Opening Control-lever pressure, bar : 172...175 position degrees: 66...74 Testing: 1st c-rod trav.mm : 9.20 Speed 1/min : 1115...1125 2nd c-rod trav.mm : 5.00 Test inj. tubing : 1 680 750 008 Outside diameter x Wall thickness Speed 1/min : 1145 4th speed 1/min: 1200 : 6,00x2,00x600 x Length mm C-rod trav.mm : 0,30...1,70 (A) Injection pump setting values Insp. values in parentheses LOWEST RATED SPEED I Set constant delivery quant. Control-lever position degrees: 17...25 per values \_\_\_\_ Setting point w/out aux. spring START OF DELIVERY 1/min : 400 Contr.-rod trav.mm: 5,80 : 1,85...1,95 : (1,80...2,00) : 1-5-3-6-2-4 Prestroke mm Testing: 1/min : 100 Cam sequence Speed C-rod trav.mm min: 19,00 1/min : 40Ó C-rod trav.mm : 5,70...5,90 C-rod trav.mm : 2,00 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0,50 (0,75) 1/min : 520...580 Speed L15

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min: 1100 C-rod trav.mm: 0,00...0,10

2nd speed 1/min: 750

C-rod trav.mm : 0,00...0,20

3rd speed 1/min : 450

C-rod trav.mm : 0,70...1,30

#### ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 9,20

Speed 1/min: 1115...1125

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 165.0...185.0 1000H.: (-)

HIGH IDLE

Speed 1/min: 1145 Del.quantity cm3/: 23,0...33,0 1000H.: (-)

#### LOW IDLE

1/min : 400 Speed

Del.quantity cm3/: 12,0...16,0

Remarks:

: JOHN DEERE

: NO. AR 88752

BOSCH INJ. PUMP TEST SPECIFICATIONS 270-315 Tolerance + - 0 : 0,50 (0,75) Note inst. in remarks column BASIC SETTING : IHC 9.0 G : 17.8.87 Test sheet Edition 1st speed 1/mi: 1600 Superceeded : ISO-4113 Calibrating oil Contr.-rod trav.mm: 12,80 Combination no. : 9 400 230 036 Del.quantity cm3/: 8,9...9,1 Injection pump 100H,: (-) : PES8A95D32ORS2619 Pump designation Governor Dispersion cm3/:0.3Governor design. : RQV325...1600AB1143R 100H.: (-) Customer-spec. information 2nd speed 1/min: 325 Contr.-rod trav. m: 7,60 Del.quantity cm3/: 0,9...1,5 100H.: (-) Customer : IHC Engine : D9L cm3/:0,3TEST BENCH REQUIREMENTS Dispersion 100H.: (-) Calibrating-oil inlet temp. OC : 40...45 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve 1st version : 1 417 413 019 1/min: 1600 Speed Del.quantity cm3/: 89,0...91,0 1000H.: (-) Inlet press., bar : 2.5 HIGHEST RATED SPEED Calibrating nozzle-holder : 0 681 343 009 assembly 1st version Control-lever position degrees: 63,5...71,5 Opening : 172...175 pressure, bar Testing: 1st c-rod trav.mm : 11,80 1/min : 1640...1650 Test inj. tubing : 1 680 750 008 Speed 2nd c-rod trav.mm : 4.00 Speed 1/min : 1820...1850 Outside diameter x Wall thickness 4th speed 1/min : 1925 : 0.00...1.00 : 6,00X2,00X600 C-rod trav.mm x Length mm LOWEST RATED SPEED I (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Control-lever position degrees: 8...16 per values \_\_\_\_ Testing: START OF DELIVERY 1/min : 100 Speed C-rod trav.mm min: 8,50 Prestroke mm : 2,95...3,05 : (2,90...3,10) Contr.-rod trav.mm: 10,50 1/min : 325 Speed C-rod trav.mm : 7,50...7,70 C-rod trav.mm : 2,00 Speed 1/min : 855...915 Cam sequence : 1-8-7-3-6-5-4-2 Speed 1/min : 100 C-rod trav.mm max: 9,30 SD ang. spacing CS: 0-45-90-135-180-225-CONSTANT REGULATION 1/min : 370....450 Speed

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TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min: 1600
C-rod trav.mm : 12,70...12,90
2nd speed 1/min : 100
  C-rod trav.mm : 12,70...12,90
SWITCH-OVER POINT
             1/min : 210 (270)
Speed
FUEL-DELIVERY CHARACTERISTICS
             1/min : 1000
Speed
Del.quantity cm3/: 86,0
             1000H.: (-)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11,80
Speed
            1/min : 1640...1650
STARTING FUEL DELIVERY
Speed
             1/min : 100
Del.quantity cm3/: 78,0...98,0
             1000H.: (-)
Contr.-rod trav.mm: 14,20
HIGH IDLE
Speed
             1/min : 1835
             cm3/: 4,0
1000H.: (-)
Dispersion
LOW IDLE
             1/min: 325
Speed
Del.quantity cm3/: 9,0...15,0
1000H.: (-)
Remarks:
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BOSCH INJ. PUMP TEST SPECIFICATIONS	270-315 Tolerance + - ° : 0,50 (0,75)
Note inst. in remarks column	BASIC SETTING
Test sheet : IHC 9.4 A3   Edition : 17.8.87   Superceeded : -   Calibrating oil : ISO-4113	1st speed 1/mi: 1250
Calibrating oil : ISO-4113	Contrrod trav.mm: 10,30
Combination no. : 9 400 231 057	Del.quantity cm3/ : 11,411,6
Injection pump Pump designation : PES8P100A921/5RS286 Governor Governor design. : RQV4001250PA541K	100H.: (-) Dispersion cm3/: 0,4 100H.: (-)
Customer-spec. information Customer : IHC	2nd speed 1/min: 400 Contrrod trav. m: 4.90
Engine : DVT 800	Del.quantity cm3/ : 1.82,2 100H.: (-)
TEST BENCH REQUIREMENTS	Dispersion cm3/: 0.5 100H.: (~)
Calibrating-oil inlet temp. °C : 4045	SLEEVE POSITION Control-lever position
Overflow valve : 1 417 413 040	Degree: 6066  Speed 1/min: 1320  Controd travelmm: 15,5017,50
Inlet press., bar : 2.8	FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzle-holder assembly : 1 688 901 017	1st version Speed 1/min: 1250
Opening pressure, bar : 207	Charge press. hPa : 1060 Del.quantity cm3/ : 114.0116.0 1000H.: (112.0118.0)
Test inj. tubing : 9 681 230 713	HIGHEST RATED SPEED 1st version
Outside diameter  x Wall thickness  x Length mm : 6,35x2,10x1000	Control-lever position degrees: 5561
(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values	Testing: 1st c-rod trav.mm : 9,30 Speed 1/min : 13001310 2nd c-rod trav.mm : 4,00 Speed 1/min : 13851415 4th speed 1/min : 1640
START OF DELIVERY	C-rod trav.mm : 0,001,00
Prestroke mm : 2,752,85 : (2,702,90) Contrrod trav.mm: 10,50 Cam sequence : 1-8-4-2-7-3-6-5	LOWEST RATED SPEED I Control-lever position degrees: 1016
SD ang. spacing CS: 0-45-90-135-180-225-	Testing: Speed 1/min: 200 C-rod trav.mm min: 7,10 Speed 1/min: 400 C-rod trav.mm : 4,805,00

C-rod trav.mm : 2,00 Speed 1/min : 565...625 CONSTANT REGULATION 1/min: 420...480 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1250 C-rod trav.mm : 10,25...10,35 2nd speed 1/min: 900 C-rod trav.mm : 11,25...11,35 3rd speed 1/min : 700 C-rod trav.mm : 10,45...10,55 compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 800 Speed Pressure hPa : 145 Contr.-rod trav.mm: 8,90...9,10 Measurement Speed 1/min : 800 1st pressure hPa : 365 C-rod trav.mm : 9,70...9,90 SWITCH-OVER POINT Speed 1/min: 240 (300) FUEL-DELIVERY CHARACTERISTICS 1st version Charge press, hPa : 1060 1/min : 900 Speed Del.quantity cm3/: 121,0...127,0 1000H.: (120,0...128,0) Charge press. hPa : -1/min : 800 Speed Del.quantity cm3/: 85.5...93.5 1000H.: (85.5...94.5) ROTATIONAL-SPEED LIMITATION 1st version

1mm control-rod travel less than

1/min : 100

1/min: 1300...1310

full-load trav.mm: 9,30

STARTING FUEL DELIVERY

Del.quantity cm3/: 188,0...228,0 1000H.: (-)

Contr.-rod trav.mm: 20,50

LOW IDLE

Speed 1/min: 400

Del.quantity cm3/: 18,0...22,0

1000H.: (-)

Remarks:

L20

Speed

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition Superceeded : MB 2.4 V7 : 09.03.87

Calibrating oil : ISO-4113

Combination no. : 0 400 074 909

Injection pump

Pump designation : PES4M55C32ORS107-2

EP type number : 0 410 054 962

Governor

Governor design. : RSF375/1900M18-4 Governer no. : 0 420 021 096

Customer-spec. information Customer

: 0M616 (2.4 L) Engine

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C : 38...42

Overflow valve

: 1 417 413 012

Inlet press., bar: 1.00

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35) Contr.-rod trav.mm: 20.00,...0.00

Cam sequence : 1- 3- 4- 2

C-rod trav.mm : 6.10...6.30 C-rod trav.mm : 2.00 Speed 1/min : 720...820 Speed 1/min : 1000 SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.00 (1.00) C-rod trav.mm max: 1.50 BASIC SETTING SET IDLE AUXILIARY SPRING 1st speed 1/mi: 1000 Speed 1/min : 450 Contr.-rod trav.mm: 4.9...5.1 : (4.8...5.2) Contr.-rod trav.mm: 13.00...13.10 Del.quantity cm3/: 3.7...3.8 TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 100H.: (3.6...3.9) C-rod trav.mm : 13.00...13.10 2nd speed 1/min: 1800 Dispersion cm3/:0.2C-rod trav.mm : 12.00...12.20 100H.: (0.3) FUEL-DELIVERY CHARACTERISTICS 1/min: 375.0 1/min : 1800 2nd speed Speed Contr.-rod trav. m: 6.1...6.3 Del.quantity cm3/: 37.5...39.5 1000H.: (36.5...40.5) Del.quantity cm3/: 0.6...0.7 100H.: (0.5...0.9) cm3/: 0.1 100H.: (0.1) cm3/: 2.50 Dispersion 1000H.: (3.00) Dispersion STARTING FUEL DELIVERY FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version Speed 1/min : 100 Del.quantity cm3/: 53.0 1000H.: (53.0) Contr.-rod trav.mm: 20.10 1/min: 1000 Speed Del.quantity cm3/: 37.5...38.5 1000H:: (36.5...39.5) Dispersion cm3/: 2.50 1000H.: (3.00) HIGH IDLE Speed 1/min : 2150 Contr.-rod trav.mm: 7.80...8.20 HIGHEST RATED SPEED Del.quantity cm3/: 18.5...22.5 1000H.: (17.5...23.5) Dispersion cm3/: 2.50 1000H.: (3.00) 1st version Control-lever position degrees: 50...0

3rd c-rod trav.mm: 7.80...8.20

Speed 1/min: 0...2150

4th speed 1/min: 2950 LOW IDLE C-rod trav.mm : 0.00...1.00 SET IDLE CONTROL-LEVER POSITION Speed 1/min : 1000 Contr.-rod trav.mm: 1.4...1.5 1000H.: (1.50) LOWEST RATED SPEED I Control-lever Remarks: position degrees: 9...13
Setting point w/out aux. spring
Speed 1/min: 375 Contr.-rod trav.mm: 6.2 CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF Testing: -Control-lever position 47°. No 1/min : 250 change in control-rod travel after Speed C-rod trav.mm min : 10.50 switchover point up to 550 1/min,

L23

1/min : 375

Speed

control-lever position 30°. Speed range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition : MB 2,0 P12 : 10.04.87

Superceeded

Calibrating oil : ISO-4113

: 0 400 074 911 Combination no.

Injection pump

Pump designation : PES4M55C32ORS163 EP type number : 0 410 054 961

Governor

Governor design. : RSF360/2300M60-6 Governor no. : 0 420 021 091

Customer-spec. information Customer : DB

: 0M601 (2.0) Engine

1st version kW : 52.0

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Contr.-rod trav.mm: 20.00...22.00 Cam sequence : 1- 3- 4- 2

1/min : 250 Speed C-rod trav.mm min: 8.50 SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.00 (1.00) Speed 1/min: 335 C-rod trav.mm : 5.00...5.20 C-rod trav.mm : 2.50 SD mark cyl. no. : 1 Speed 1/min: 1000 C-rod trav.mm max: 2.00 BASIC SETTING SET IDLE AUXILIARY SPRING 1/mi: 1000 Speed 1/min: 400 1st speed Contr.-rod trav.mm: 3.80...4.00 Contr.-rod trav.mm: 11.10...11.20 : (3.70...4.10) Del.quantity cm3/: 3.0...3.1 TORQUE CONTROL Torque-control curve - 1st version 100H.: (2.9...3.2) 1st speed 1/min: 1000 C-rod trav.mm: 11.10...11.20 2nd speed 1/min: 1800 cm3/: 0.2 Dispersion C-rod trav.mm : 10.50...10.70 3rd speed 1/min : 2200 100H.: (0.3) C-rod trav.mm : 10.00...10.20 2nd speed 1/min: 335.0 Contr.-rod trav. m: 5.0...5.2 Del.quantity cm3/: 0.5...0.6 100H.: (0.4...0.9) Measurement Speed 1/min: 1000 Dispersion cm3/:0.1100H.: (0.1) 1st pressure hPa : 900 C-rod trav.mm : 0.50...0.70 2nd pressure hPa : 750 FULL-LOAD DELIV. AT FULL-LOAD STOP C-rod trav.mm : 1.80...2.20 1st version 1/min: 1000 Speed FUEL-DELIVERY CHARACTERISTICS Charge press. hPa: 1100 Del.quantity cm3/: 30.5...31.5 1000H.: (29.5...32.5) 1st version Dispersion cm3/: 2.50 1000H.: (3.00) Charge press. hPa : 1100 Speed 1/min: 1800
Del.quantity cm3/: 33.5...35.0
1000H:: (32.5...36.0)
Dispersion cm3/: 2.50 HIGHEST RATED SPEED 1st version 1000H.: (3.00) Control-lever Charge press. hPa : 1100 position degrees: 50...0
3rd c-rod trav.mm: 6.80...7.20 Speed 1/min: 2200
Del.quantity cm3/: 31.0...33.0
1000H.: (30.0...34.0)
Dispersion cm3/: 2.50 Speed 1/min: 0...2500 4th speed 1/min: 2950 C-rod trav.mm : 0.00...1.00 1000H.: 3.00 SET IDLE CONTROL-LEVER POSITION | STARTING FUEL DELIVERY 1/min : 1000 Speed Contr.-rod trav.mm: 1.9...2.0 1/min : 100 Speed Del.quantity cm3/: 55.0 LOWEST RATED SPEED I 1000H.: (55.0) Control-lever Contr.-rod trav.mm: 20.10 position degrees: 10...14 Setting point w/out aux. spring 1/min : 335 HIGH IDLE Contr.-rod trav.mm: 5.1 1st version

Testing:

Charge press. hPa : 1100 1/min : 2500 Speed Contr.-rod trav.mm: 6.80...7.20 Del.quantity cm3/: 16.0...20.0 1000H.: (15.0...21.0) Dispersion cm3/: 2.50 1000H.: (3.00) LOW IDLE Speed 1/min : 335 Contr.-rod trav.mm: 5.00...5.20
Del.quantity cm3/: 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/: 1.00 1000H.: (1.50) Remarks: CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5° control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam). START-OF-DELIVERY ADJUSTMENT -Start-of delivery adjustment and lock after start-of-delivery mean value of all cylinders, 17.3...17.70 (17.2...17.80) angular displacement of the cam after cylinder 1. TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 335 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum,

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F6 Edition : 02.06.87 : -

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 400 075 959

Injection pump

Pump designation : PES5M55C32ORS166 EP type number : 0 410 055 980

Governor

Governor design. : RSF340/2300M64-1 Governer no. : 0 420 021 050

Customer-spec. information Customer

: 0M602A Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85) Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

Testing: Speed 1/min : 220 C-rod trav.mm min: 8.90 SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00) Speed 1/min : 315 C-rod trav.mm : 4.90...5.10 C-rod trav.mm : 2.50 Speed 1/min : 525...625 Speed 1/min : 1000 C-rod trav.mm max : 1.80 SD mark cyl. no. : 1 BASIC SETTING 1/mi: 1000 SET IDLE AUXILIARY SPRING 1st speed 1/min : 380 Contr.-rod trav.mm: 14.00...14.10 Contr.-rod trav.mm: 4,2...4,4 : (4,1...4,5) Del.quantity cm3/: 5.1...5.2 TORQUE CONTROL 100H.: (5.0...5.3) Torque-control curve - 1st version 1st speed 1/min: 1000 C-rod trav.mm: 14.00...14.10 2nd speed 1/min: 1600 C-rod trav.mm: 13.30...13.50 cm3/ : 0.2 Dispersion 100H.: (0.3) 3rd speed 1/min : 2200 2nd speed 1/min: 315.0 C-rod trav.mm : 12.80...13.00 Contr.-rod trav. m: 4.9...5.1 Del.quantity cm3/: 0.5...0.6 100H:: (0.4...0.8) Dispersion cm3/: 0.1 100H:: (0.15) compensator (LDA, ADA, ALDA) 1st version Setting FULL-LOAD DELIV. AT FULL-LOAD STOP 1/min : 1000 Speed Pressure hPa : 1600 Contr.-rod trav.mm: 0.50...0.90 1st version Speed 1/min: 1000 Charge press. hPa: 1850
Del.quantity cm3/: 51.0...52.0
1000H: (50.0...53.0)
Dispersion cm3/: 2.50 Measurement 1/min : 1000 Speed 1st pressure hPa : 1050 C-rod trav.mm : 3.90...4.10 2nd pressure hPa : 750 1000H.: (3.00) HIGHEST RATED SPEED C-rod trav.mm : 5.80...6.20 1st version FUEL-DELIVERY CHARACTERISTICS Control-lever position degrees: 50...0

3rd c-rod trav.mm: 8.10...8.50

\$peed 1/min: 0...2500

4th speed 1/min: 2950 1st version Charge press. hPa : 1850 C-rod trav.mm : 0.00...1.00 1/min : 1600 Del.quantity cm3/: 50.0...51.5 1000H.: (49.0...52.5) SET IDLE CONTROL-LEVER cm3/: 2.50Dispersion POSITION 1000H.: (3.00) Charge press. hPa : 1850 1/min : 1000 Speed Contr.-rod trav.mm: 1,7...1,8 Speed 1/min: 2200
Del.quantity cm3/: 48.5...50.5
1000H:: (47.5...51.5)
Dispersion cm3/: 2.50
1000H:: 3.00 LOWEST RATED SPEED I Control-lever position degrees: 8...12 Setting point w/out aux. spring Charge press. hPa: 1050 Speed 1/min : 315 Contr.-rod trav.mm: 5.0 Speed 1/min : 1000

Del.quantity cm3/: 33.0...34.0 1000H: (32.0...35.0) Dispersion cm3/: 2.50 1000H.: 3.00 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 52.0...0.0 1000H.: (52.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE 1st version Charge press. hPa : 1850 Speed 1/min : 2500 Contr.-rod trav.mm: 8.10...8.50 Del.quantity cm3/: 31.0...35.0 1000H.: (30.0...36.0) cm3/: 2.50 1000H.: (3.00) Dispersion LOW IDLE 1/min : 315 Speed Contr.-rod trav.mm: 4.90...5.10 Del.quantity cm3/ : 5.0...6.0 1000H.: (4.0...8.5) cm3/: 1.00Dispersion 1000H.: (1.50) SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) Control lever at idle stop Speed 1/min : 340 Contr.-rod trav.mm: 12,4...13,8 Del.quantity cm3/: 41,0...49,0 1000H.: -Electric current A: 1,8 Control lever at full-load stop Speed 1/min : 2950 Contr.-rod trav.mm: 0...1.0 Electric current short-duration A: 3,0 Starting test 1/min : 100 Speed Del,quantity cm3/: -min. 1000H.: 55,0 Remarks: CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°,

control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

SETTING OF FBG
-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Testing and adjusting the control-rodtravel sensor with evaluation circuit
R2.1.3
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 3.230...3.310
(3.190...3.350) V must be displayed
on the digital voltmeter.
Adjustment of the control-rod travel
sensor
At a speed of 1000 1/min, set fuel
delivery at 23.0...24.0 (22.0...25.0)
ccm/1000 strokes with control lever.
Shift control-rod-travel sensor until
U = 2.095...2.105 (2.098...2.102) V is
indicated. Tighten fastening screws
with 1...2 Nm. Control lever to full-

load stop; voltage value of 3.230...

3.310 V must be attained,

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00) : MB 2.5 F3 : 07.11.86 Test sheet Edition Superceeded SD mark cyl. no. : 1 : ISO-4113 Calibrating oil BASIC SETTING : 0 400 075 966 Combination no. 1/mi: 1000 1st speed Injection pump Pump designation : PES5M55C32ORS158 Contr.-rod trav.mm: 13.90...14.00 EP type number : 0 410 055 986 Del.quantity cm3/ : 5.1...5.2 Governor Governor design. : RSF340/2300M64-11 Governor no. : 0 420 021 086 100H.: (5.0...5.3) cm3/:0.2Customer-spec. in formation Dispersion Customer : DB 100H.: (0.3) Engine : 0M602A 2nd speed 1/min: 315.0 Contr.-rod trav. m: 5.4...5.6 Del.quantity cm3/: 0.5...0.6 100H.: (0.4...0.9) Dispersion cm3/: 0.1 100H.: (0.1) 1st version kW : 92.0 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. C : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version 1/min: 1000 Speed Charge press. hPa: 1850
Del.quantity cm3/: 51.0...52.0
1000H: (50.0...53.0)
Dispersion cm3/: 2.50 Inlet press., bar: 1.00 Calibrating nozzle-holder : 0 681 343 009 assembly 1000H.: (3.00) Opening pressure, bar : 172...175 HIGHEST RATED SPEED 1st version Control-lever position degrees: 50...0
3rd c-rod trav.mm: 8.10...8,5
Speed 1/min: 2500 Test inj. tubing : 1 680 750 014 Outside diameter 1/min : 2950 x Wall thickness 4th speed : 6.00x2.00x600 C-rod trav.mm : 0.00...1.00 x Length mm SET IDLE CONTROL-LEVER (A) Injection pump setting values Insp. values in parentheses POSITION Set constant delivery quant. Speed 1/min : 1000 Contr.-rod trav.mm: 1,7...1,8 per values \_\_\_\_ START OF DELIVERY LOWEST RATED SPEED I Test pressure, bar: 30...32 Control-lever position degrees: 8...12 Setting point w/out aux. spring Speed 1/min: 315 : 2.20 ... 2.30 Prestroke mm : (2.15...2.35) Contr.-rod trav.mm: 20.00...22.00 Contr.-rod trav.mm: 5.5 Cam sequence : 1- 2- 4- 5-

MO3

Testing: Del.quantity cm3/: 33.0...34.0 1,000H.: (32.0...35.0) 1/min : 220 Speed cm3/ : 2.50 C-rod trav.mm min : 8.00 Dispersion 1/min : 315 1000H.: 3.00 Speed : 5.40...5.60 C-rod trav.mm m : 2.50 1/min : 540...640 STARTING FUEL DELIVERY C-rod trav.mm Speed Speed 1/min : 1000 C-rod trav.mm max: 1.80 1/min : 100 Speed Del.quantity cm3/: 52.0...0.0 SET IDLE AUXILIARY SPRING 1000H.: (52.0...0.0) Speed 1/min : 380 Contr.-rod trav.mm: 20.10...0.00 Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) HIGH IDLE TORQUE CONTROL 1st version Charge press. hPa : 1850 Torque-control curve - 1st version 1/min : 2500 1/min : 1000 1st speed : 13.90...14.00 Contr.-rod trav.mm: 8.10...8.50 C-rod trav.mm Del.quantity cm3/: 29.0...33.0 2nd speed 1/min: 1600 1000H.: (28.0...34.0) C-rod trav.mm : 13.20...13.40 cm3/: 2.50 1000H.: (3.00) 3rd speed 1/min: 2200 Dispersion : 12.30...12.50 C-rod trav.mm compensator (LDA,ADA,ALDA) LOW IDLE 1/min : 315 Speed Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/: 5.5...6.5
1000H: (4.5...9.0)
Dispersion cm3/: 1.00 1st version Setting Speed 1/min : 1000 : 1600 Pressure hPa Contr.-rod trav.mm: 0.50...0.90 1000H.: (1.50) SETTING/TESTING ELECTRONIC IDLE Measurement 1/min : 1000 REGULATION (ELR) Speed Control lever at idle stop 1st pressure hPa : 1050 : 3.90...4.10 1/min : 340 C-rod trav.mm Speed Contr.-rod trav.mm: 12,4...13,8 : 750 2nd pressure hPa Del.quantity cm3/: -1000H.: (41,0...49,0) C-rod trav.mm : 5.80...6.20 Electric current A: 1,8 Control lever at full-load stop FUEL-DELIVERY CHARACTERISTICS 1/min : 2950 Speed Contr.-rod trav.mm: 0,0...1,0 1st version Charge press, hPa : 1850 Electric current 1/min : 1600 short-duration A: 3,0 Speed Del.quantity cm3/ : 50.0...51.5 Starting test 1000H.: (49.0...52.5) 1/min : 100 Speed cm3/ : 2.50 Del.quantity cm3/: -Dispersion 1000H.: 55.0 1000H.: (3,00) min. Charge press. hPa : 1850 Speed 1/min : 2200 Remarks: Del.quantity cm3/: 48.5...50.5 1000H.: (47.5...51.5) SETTING OF FBG -Setting and locking of FBG according cm3/: 2.50 1000H.: 3.00 to start-of-delivery average of all cylinders 19.3...19.70 (19.2...19.80). Dispersion Charge press. hPa : 1050 Cam angle according to cyl. 1. 1/min : 1000 Speed

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop,
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Testing\_and\_adjusting\_the\_control-rodtravel\_sensor\_with\_evaluation\_circuit R2.1.3 Receiving\_inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter. Adjustment of the control-rod travel

sensor
At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230... 3.310 V must be attained.

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BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                    SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00)
                   : MB 2,5 G1
Test sheet
                   : 03.04.87
Edition
Superceeded
                                                     SD mark cyl. no. : 1
Calibrating oil
                   : ISO-4113
                                                    BASIC SETTING
Combination no.
                   : 0 400 075 980
                                                     1st speed
                                                                   1/mi: 1000
Injection pump
Pump designation : PES5M55C32ORS158
                                                    Contr.-rod trav.mm: 13.90...14.00
EP type number
                   : 0 410 055 986
                                                    Del.quantity cm3/: 5.1...5.2
Governor
Governor design. : RSF340/2300M64-1
                                                                   100H.: (5.0...5.3)
Governer no.
                   : 0 420 021 050
Customer-spec. information
                                                                  cm3/: 0.2
                                                    Dispersion
Customer
                   : DB
                                                                   100H.: (0.3)
                   : 0M602A
Engine
                                                    2nd speed 1/min: 315.0
Contr.-rod trav. m: 5.4...5.6
1st version kW
                   : 92.0
                                                    Del.quantity cm3/: 0.5...0.6
TEST BENCH REQUIREMENTS
                                                                   100H.: (0.4...0.9)
                                                                  cm3/: 0.1
                                                    Dispersion
Calibrating-oil inlet temp. °C
                                                                   100H.: (0.1)
                   : 38...42
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                   : 1 469 990 351
                                                    1st version
                                                                  1/min: 1000
                                                    Speed
                                                    Charge press. hPa : 1850
Inlet press., bar: 1.00
                                                    Del.quantity cm3/: 51.0...52.0
                                                                 1000H.: (50.0...53.0)
cm3/ : 2.50
Calibrating nozzle-holder
                : 0 681 343 009
 assembly
                                                    Dispersion
                                                                 1000H.: (3.00)
Opening
pressure, bar : 172...175
                                                    HIGHEST RATED SPEED
                                                    1st version
                                                    Control-lever
Test inj. tubing : 1 680 750 014
                                                     position degrees: 50...0
                                                    3rd c-rod trav.mm: 8,10...8,50
Speed 1/min: 2500
4th speed 1/min: 2950
Outside diameter
x Wall thickness
                                                                        : 0.00...1.00
                   : 6.00x2.00x600
                                                       C-rod trav.mm
x Length mm
                                                    SET IDLE CONTROL-LEVER
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                    POSITION
                                                                 1/min : 1000
                                                    Speed
                                                    Contr.-rod trav.mm: 1,7...1,8
    per values
                                                    LOWEST RATED SPEED I
START OF DELIVERY
                                                    Control-lever
Test pressure, bar: 30...32
                                                     position degrees: 8...12
                                                    Setting point w/out aux. spring
                   : 2.10...2.20
Prestroke mm
                                                    Speed 1/min: 315
                   : (2.05...2.25)
Contr.-rod trav.mm: 20.00...22.00
                                                    Contr.-rod trav.mm: 5.5
Cam sequence : 1- 2- 4- 5-
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M06

Del.quantity cm3/ : 33.0...34.0 Testing: 1/min : 220 1000H.: (32.0...35.0) Speed C-rod trav.mm min : 8.00 cm3/: 2.50Dispersion 1/min : 315 1000H.: 3.00 Speed : 5.40...5.60 : 2.50 C-rod trav.mm C-rod trav.mm STARTING FUEL DELIVERY 1/min : 540...640 Speed 1/min: 1000 Speed C-rod trav mm max: 1.80 Speed 1/min : 100 Del.quantity cm3/ : 52.0...0.0 1000H.: (52.0...0.0) SET IDLE AUXILIARY SPRING 1/min : 380 Contr.-rod trav.mm: 20.10...0.00 Speed Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) HIGH IDLE TORQUE CONTROL 1st version Torque-control curve - 1st version Charge press. hPa : 1850 1/min : 1000 1/min : 2500 1st speed : 13.90...14.00 Contr.-rod tray.mm: 8.10...8.50 C-rod trav.mm Del.quantity cm3/ : 29.0...33.0 2nd speed 1/min: 1600 1000H.: (28.0...34.0) C-rod trav.mm : 13.20...13.40 cm3/ : 2.50 3rd speed 1/min : 2200 Dispersion 1000H.: (3.00) : 12.30...12.50 C-rod trav.mm compensator (LDA,ADA,ALDA) LOW IDLE Speed 1/min : 315 Contr.-rod trav.mm: 5.40...5.60 1st version Del.quantity cm3/ : 5.5...6.5 Setting 1000H.: (4.5...9.0) Speed 1/min : 1000 cm3/: 1.00 1000H.: (1.50) hPa : 1600 Pressure Dispersion Contr.-rod trav.mm: 0.50...0.90 SETTING/TESTING ELECTRONIC IDLE Measurement 1/min : 1000 REGULATION (ELR) Speed 1st pressure hPa : 1050 Control lever at idle stop : 3.90,..4.10 : 750 C-rod trav.mm Speed 1/min : 340 Contr.-rod trav.mm: (12,4...13,8) Del.quantity cm3/: (41,0...49,0) 1000H.: -2nd pressure hPa C-rod trav.mm : 5.80...6.20 FUEL-DELIVERY CHARACTERISTICS Electric current A: 1,8 Control lever at full-load stop Speed 1/min : 2950 Contr.-rod trav.mm: (0,0...1,0) 1st version Charge press. hPa : 1850 Electric current Speed 1/min: 1600 Del.quantity cm3/: 50.0...51.5 1000H:: (49.0...52.5) short-duration A: 3.0 Starting test 1/min : 100 Speed cm3/: 2.50Del.quantity cm3/: -Dispersion 1000H.: (3.00) 1000H.: 52.0 Charge press. hPa : 1850 Speed 1/min : 2200 Remarks: Del.quantity cm3/: 48.5...50.5 1000H.: (47.5...51.5) Dispersion cm3/: 2.50 1000H.: 3.00 SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Charge press. hPa : 1050 Cam angle according to cyl. 1. Speed 1/min : 1000 M07

Start-of-delivery spacing (difference) between max/min value 1 cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Testing and adjusting the control-rod-travel sensor with evaluation circuit R2.1.3
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310
(3.190...3.350) V must be displayed on the digital voltmeter.
Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel

delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230... 3.310 V must be attained.

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BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                           SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00)
Test sheet
                     : MB 3,0 W13
                     : 07.11.86
Superceeded
                                                           SD mark cyl. no. : 1
Calibrating oil : ISO-4113
                                                           BASIC SETTING
Combination no. : 0 400 076 980
                                                                          1/mi: 1000
                                                           1st speed
Injection pump
Pump designation : PES6M55C32ORS157
                                                           Contr.-rod trav.mm: 13.90...14.00
EP type number : 0 410 056 993
                                                           Del.quantity cm3/ : 5.1...5.2
Governor
Governor design. : RSF315/2300M64-10
Governer no. : 0 420 021 085
                                                                          100H.: (5.0...5.3)
Customer-spec. information
                                                           Dispersion
                                                                          cm3/:0.2
Customer
                    : DB
                                                                          100H.: (0.3)
Engine
                     : 0M603A
                                                          2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/: 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/: 0.1
1st version kW
                   : 110.0
TEST BENCH REQUIREMENTS
                                                                          100H.: (0.1)
Calibrating-oil inlet temp. °C
                     : 38...42
                                                           FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                      : 1 469 990 351
                                                           1st version
                                                           Speed
                                                                          1/min: 1000
                                                          Charge press. hPa: 1850
Del.quantity cm3/: 51.0...52.0
1000H:: (50.0...53.0)
Dispersion cm3/: 2.50
1000H:: (3.00)
Inlet press., bar : 1.00
Calibrating nozzle-holder
             : 0 681 343 009
 assembly
Opening
 pressure, bar : 172...175
                                                           HIGHEST RATED SPEED
                                                           1st version
                                                           Control-lever
                                                          position degrees: 50...0

3rd c-rod trav.mm: 8.10...8,50

Speed 1/min: 2500

4th speed 1/min: 2950
Test inj. tubing : 1 680 750 014
Outside diameter x Wall thickness
                                                             C-rod trav.mm : 0.00...1.00
                    : 6.00x2.00x600
x Length mm
                                                           SET IDLE CONTROL-LEVER
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                           POSITION
                                                                         1/min : 1000
                                                           Speed
                                                           Contr.-rod trav.mm: 1,7...1,8
    per values
START OF DELIVERY
                                                          LOWEST RATED SPEED I
Test pressure, bar: 30...32
                                                          Control-lever
                                                           position degrees: 8...12
                                                           Setting point w/out aux. spring
                     : 2.20...2.30
Prestroke mm
                     : (2.15...2.35)
                                                           Speed 1/min: 290
Contr.-rod trav.mm: 20.00...22.00
Cam sequence : 1-5- 3- 6- 2- 4
                                                           Contr.-rod trav.mm: 5.4
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M09

Testing: Del.quantity cm3/: 33.0...34.0 1/min : 200 1000H.: (32.0...35.0) Speed C-rod trav.mm min: 7.00 cm3/: 2.50Dispersion 1/min : 290 1000H.: 3.00 Speed : 5.30...5.50 : 2.50 C-rod trav.mm C-rod trav.mm STARTING FUEL DELIVERY 1/min: 510...610 1/min: 1000 Speed Speed C-rod trav.mm max: 1.80 1/min : 100 Speed Del.quantity cm3/: 52.0...0.0 SET IDLE AUXILIARY SPRING 1000H.: (52.0...0.0) Contr.-rod trav.mm: 20.10...0.00 1/min : 360 Speed Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) HIGH IDLE TORQUE CONTROL 1st version Torque-control curve - 1st version Charge press. hPa: 1850 1/min : 1000 1st speed 1/min : 2500 C-rod trav.mm : 13.90...14.00 Contr.-rod trav.mm: 8.10...8.50 Del.quantity cm3/: 29.0...33.0 1000H.: (28.0...34.0) Dispersion cm3/: 2.50 1000H.: (3.00) 2nd speed 1/min : 1600 C-rod trav.mm : 13.20...13.40 3rd speed 1/min : 2200 C-rod trav.mm : 12.30...12.50 LOW IDLE compensator (LDA,ADA,ALDA) Speed 1/min : 290 Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/: 5.5...6.5
1000H: (5.0...9.5)
Dispersion cm3/: 1.00 1st version Setting 1/min : 1000 Speed hPa : 1600 Pressure Contr.-rod trav.mm: 0.50...0.90 1000H.: (1.50) Measurement SETTING/TESTING ELECTRONIC IDLE Speed 1/min : 1000 REGULATION (ELR) 1st pressure hPa : 1050 Control lever at idle stop C-rod trav.mm : 3.90...4.10 2nd pressure hPa : 750 Speed 1/min : 315 Contr.-rod trav.mm: (12,8...14,2) Del.quantity cm3/: -1000H.: (42,0...49,0) C-rod trav.mm : 5.80...6.20 Electric current A: 1,8 FUEL-DELIVERY CHARACTERISTICS Control lever at full-load stop 1/min : 2950 Speed Contr.-rod trav.mm: (0,0...1,0) 1st version Charge press. hPa : 1850 Electric current 1/min : 1600 short-duration A : 3,0 Speed Del.quantity cm3/: 50.0...51.5 Starting test 1000H.: (49.0...52.5) 1/min : 100 Speed Dispersion cm3/: 2.50 1000H.: (3.00) Charge press. hPa: 1850 Del.quantity cm3/: -min. 1000H.: 52,0 min. 1/min : 2200 Remarks: Speed Del.quantity cm3/: 48.5...50.5 1000H:: (47.5...51.5) SETTING OF FBG -Setting and locking of FBG according cm3/: 2.50 1000H.: 3.00 to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Dispersion Charge press. hPa: 1050 Cam angle according to cyl. 1. Speed 1/min : 1000

Start-of-delivery spacing (difference) between max/min value 1 cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Testing and adjusting the control-rod-travel sensor with evaluation circuit R2.1.3
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.
Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0)

delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230... 3.310 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS SD ang. spacing CS: 0-75-120-195-240-315 Tolerance + - : 0.50 (0.75) Note inst. in remarks column Test sheet : KHD 8,0 M 2 SD mark cyl. no. : 1 : 12.09.86 Edition Superceeded : 9.64 BASIC SETTING Calibrating oil : ISO-4113 1st speed 1/mi: 1130 Combination no. : 0 400 246 090 Contr.-rod trav.mm: 13.40...13.50 Injection pump Del.quantity cm3/ : 7.1...7.2 Pump designation : PE6A75D32ORS1035Z EP type number : 0 410 276 <del>9</del>67 100H.: (6.9...7.3) Governor Governor design. : RQ250/1150AB143DR : 0 420 203 034 Governer no. Dispersion cm3/:0.2Customer-spec. information 100H.: (0.3) Customer : KHD 2nd speed 1/min: 250.0 Contr.-rod trav. m: 5.9...6.1 : F6L613 Engine TEST BENCH REQUIREMENTS SLEEVE POSITION Control-lever position Calibrating-oil inlet temp. OC Degree: -1 17min: 500 : 38...42 Speed Cont.-rod travelmm: 15.60...16.40 Overflow valve : 1 417 413 000 FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version Inlet press., bar : 1.00 Speed 1/min: 1130 Del.quantity cm3/ : 71.0...72.0 Calibrating nozzle-holder : 0 681 343 009 1000H.: (69.5...73.5) assembly cm3/ : 2.00 Dispersion 1000H.: (3.50) Opening pressure, bar : 172...175 HIGHEST RATED SPEED Test inj. tubing : 1 680 750 014 Setting point: 1/min : 500 Speed Contr.-rod trav.mm: 16.0 Outside diameter x Wall thickness x Length mm : 6,00x2,00x600 Testing: 1st c-rod trav.mm : 12.40 Speed 1/min : 1175...1190 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. 2nd c-rod trav.mm : 4.00 Speed 1/min: 1210...1240 1/min : 1400 per values 4th speed C-rod trav.mm : 0.00....1.00 START OF DELIVERY LOWEST RATED SPEED I Test pressure, bar: 25...27 Setting point w/out aux. spring : 1.90...2.00 : (1.85...2.05) 1/min : 250 Prestroke mm Speed Contr.-rod trav.mm: 6.0 Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 6- 3- 5- 2- 4 Testing: 1/min : 100 Speed C-rod trav.mm min: 7.50

1/min : 285...325 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min: 1130 C-rod trav.mm: 13.40...13.50 2nd speed 1/min: 600 C-rod trav.mm : 14.60...14.70 3rd speed 1/min : 790 C-rod trav.mm : 14.40...14.60 4th speed 1/min : 1020 C-rod trav.mm : 13.60...13.90 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 600
Del.quantity cm3/: 76.5...78.5
1000H: (75.0...80.0)
Speed 1/min: 1000 Del.quantity cm3/: 73.5...75.5 1000H.: (72.0...77.0) SETTING CONTROL-ROD STOP Speed 1/min : 600 ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 12.40 Speed 1/min: 1175...1190

Remarks:

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 3- 4- 2 BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : MB 4.0 A 5 : 27.03.87 SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) Edition Superceeded Calibrating oil : ISO-4113 BASIC SETTING Combination no. : 0 400 844 092 1/mi: 1300 1st speed Injection pump Pump designation : PES4A90D41CRS2666-2 Contr.-rod trav.mm: 10.50...10.60 EP type number : 0 410 894 033 Del.quantity cm3/: 6.2...6.3 Governor Governor design. : RQV300...1300AB1065-100H.: (6.0...6.5) 13L : 0 420 212 208 Governer no. cm3/:0.3Dispersion Customer-spec. information 100H.: (0.5) Customer : DAIMLER-BENZ Engine : 0M364 1/min: 300.0 2nd speed Contr.-rod trav. m: 8.0...8.6 Del.quantity cm3/: 1.0...1.2 100H.: (0.8...1.4) 1st version kW : 64.0 1/min: 2600 Speed cm3/: 0.2 100H.: (0.4) Dispersion TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C (B) Setting of injection pump with externally-mounted governor : 38...42 Overflow valve SLEEVE TRAVELS : 1 417 413 000 1st speed 1/min: 300 Sleeve travel mm: 0.80...1.30 2nd speed 1/min: 500
Sleeve travel mm: 2.30...2.80
3rd speed 1/min: 750
Sleeve travel mm: 4.10...4.30 Inlet press., bar: 1.00 Calibrating nozzle-holder : 0 681 343 009 assembly 4th speed 1/min: 1500 Sleeve travel mm: 8.50...8.60 Opening pressure, bar : 172...175 SLEEVE POSITION Control-lever position Degree: -1 1/min: 1500 Test in i. tubing : 1 680 750 015 Cont.-rod travelmm: 15.20...17.80 Outside diameter x Wall thickness FULL-LOAD DELIV. AT FULL-LOAD STOP x Length mm : 6.00x1.50x600 (A) Injection pump setting values 1st version Insp. values in parentheses Set constant delivery quant. 1/min: 1300 Speed Del.quantity cm3/: 62.0...63.0 1000H.: (60.0...65.0) Dispersion cm3/: 3.00 1000H.: (5.00) per values START OF DELIVERY Test pressure, bar: 25...27 HIGHEST RATED SPEED : 2.25...2.35 Prestroke mm 1st version : (2.20...2.40)

M14

Control-lever position degrees: 107...115 Testing: 1st c-rod trav.mm : 9.50 Speed 1/min: 1340...1350 2nd c-rod trav.mm : 4.00 Speed 1/min: 1450...1480 4th speed 1/min : 1600 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 69...77 Testing: 1/min : 100 Speed C-rod trav.mm min : 9.80 Speed 1/min: 300 C-rod trav.mm : 8.20...8.40 nm : 2.00 1/min : 550...610 C-rod trav.mm Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 1300 1st speed C-rod trav.mm : 10.50...10.60 1/min : 750 2nd speed C-rod trav.mm : 11.50...11.60 3rd speed 1/min : 1000 C-rod trav.mm : 11.10...11.30 4th speed 1/min: 1100 C-rod trav.mm : 10.70...11.00 SWITCH-OVER POINT Speed 1/min : 220 (240) FUEL-DELIVERY CHARACTERISTICS 1/min : 750 Speed Del.quantity cm3/ : 55.0...58.0 1000H.: (52.5...60.5) 1/min : 1000 Speed Del.quantity cm3/: 57.0...60.0 1000H.: (54.5...62.5) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 9.50 1/min : 1340...1350 Speed STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 78.0...88.0 1000H:: (75.0...91.0)

M15

Contr.-rod trav.mm: 16.00...16.40

LOW IDLE

Speed 1/min: 300 Contr.-rod trav.mm: 8.00...8.60 Del.quantity cm3/: 10.0...12.0 1000H.: (8.0...14.0)

Dispersion cm3/: 2.50 1000H.: (4.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 4.0 A 6 : 27.03.87 Edition

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 400 844 093

Injection pump

Pump designation : PES4A90D41DRS2666-2 EP type number : 0 410 894 033

Governor

: RQV300...1300AB1065-Governor design.

14L Governer no. : 0 420 212 209

Customer-spec. information

: DAIMLER-BENZ Customer

: 0M364 Engine

1st version kW : 64.0 1/min: 2600 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. "C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35

: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 3- 4- 2 Control-lever position degrees: 106...114 Testing: 1st c-rod trav.mm: 9.50 Speed 1/min: 1340...1350 SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) 2nd c-rod trav.mm: 4.00 Speed 1/min: 1450...1480 4th speed 1/min: 1600 BASIC SETTING C-rod trav.mm : 0.00...1.00 1/mi: 1300 1st speed LOWEST RATED SPEED I Contr.-rod trav.mm: 10.50...10.60 Control-lever position degrees: 71...79 Del.quantity cm3/ : 6.2...6.3 Testing: 100H.: (6.0...6.5) 1/min : 100 Speed C-rod trav.mm min: 9.80 cm3/: 0.3Dispersion Speed 1/min: 300 C-rod trav.mm : 8.20...8.40 100#.: (0.5) mm : 2.00 1/min : 540...600 C-rod trav.mm Speed 2nd speed 1/min: 300.0 Contr.-rod trav. m: 8.0...8.6 TORQUE CONTROL Del.quantity cm3/: 1.0...1.2 Torque-control curve - 1st version 100H.: (0.8..1.4) cm3/: 0.2 100H.: (0.4) 1/min : 1300 1st speed C-rod trav.mm : 10.50...10.60 Dispersion 2nd speed 1/min: 750 C-rod trav.mm : 11.50...11.60

3rd speed 1/min : 1000
C-rod trav.mm : 11.10...11.30

4th speed 1/min : 1100
C-rod trav.mm : 10.70...11.00 (B) Setting of injection pump with externally-mounted governor SLEEVE TRAVELS 1st speed 1/min: 300 Sleeve travel mm: 0.80...1.30 SWITCH-OVER POINT 2nd speed 1/min: 500
Sleeve travel mm: 2.30...2.80
3rd speed 1/min: 750
Sleeve travel mm: 4.10...4.30 Speed 1/min: 220 (240) FUEL-DELIVERY CHARACTERISTICS 1/min : 750 4th speed 1/min: 1500 Speed Del.quantity cm3/: 55.0...58.0 1000H.: (52.5...60.5) Sleeve travel mm: 8.50...8.60 SLEEVE POSITION 1/min : 1000 Speed Del.quantity cm3/: 57.0...60.0 Control-lever position Degree: -1 Speed 1/min: 1500 Cont.-rod travelmm: 15.20...17.80 1000H.: (54.5...62.5) ROTATIONAL-SPEED LIMITATION FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version 1mm control-rod travel less than 1st version full-load trav.mm: 9.50 1/min: 1300 Speed Del.quantity cm3/: 62.0...63.0 1000H.: (60.0...65.0) Dispersion cm3/: 3.00 1000H.: (5.00) 1/min : 1340...1350 Speed STARTING FUEL DELIVERY HIGHEST RATED SPEED Speed 1/min : 100 Del.quantity cm3/: 78.0...88.0 1000H.: (75.0...91.0) 1st version

Contr.-rod trav.mm: 16.00...16.40

LOW IDLE

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 9.2 F Edition : 28.08.87 Superceeded : 11.85 Calibrating oil : ISO-4113 : MAN 9,2 F 1

Combination no. : 0 400 845 079

Injection pump

Pump designation : PES5A95D320LS2504 EP type number : 0 410 895 984

Governor

Governor design. : RQ250/1100AB1197R Governer no. : 0 420 201 639

Customer-spec. information Customer : MAN

Engine : D2565 MUL

1st version kW : 141.0 Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening.

pressure, bar : 172...175

Test inj. tubing : 1 680 750 003

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quanta

per values \_\_\_\_

START OF DELIVERY

Test pressure, bar: 25...27

: 1.50...1.60 : (1.45...1.65) Prestroke mm

Contr.-rod trav.mm: 9.00...12.00

: 1- 3- 5- 4- 2 Cam sequence Contra-rod trav.mm: 6.5 Testing: 1/min : 100 Speed SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.50 (0.75) C-rod trav.mm min: 8.00 1/min : 250 Speed C-rod trav.mm : 6.40...6.60 BASIC SETTING C-rod trav.mm nm : 2.00 1/min : 370...410 Speed 1/mi: 1100 1st speed TORQUE CONTROL : 0.40 Contr.-rod trav.mm: 11.30...11.40 Dimension a mm Torque-control curve - 1st version 1/min : 1100 Del.quantity cm3/: 11.4...11.6 1st speed C-rod trav.mm : 11.30...11.40 1/min : 600 100H.: (11.2...11.8) 2nd speed C-rod trav.mm : 11.70...11.80 3rd speed 1/min: 940 Dispersion cm3/:0.3C-rod trav.mm : 11.50...11.70 100H.: (0.6) 4th speed 1/min: 1015 C-rod trav.mm : 11.40...11.60 2nd speed 1/min: 250.0 Contr.-rod trav. m: 6.4...6.6 FUEL-DELIVERY CHARACTERISTICS Del.quantity cm3/: 1.5...2.1 1/min : 500 Speed 100H.: (1.2...2.3) cm3/: 0.3 100H.: (0.5) Del.quantity cm3/: 113.0...116.0 1000H.: (110.5...118.5) Speed 1/min: 800 Dispersion Del.quantity cm3/: 115.5...118.5 SLEEVE POSITION 1000H.: (113.0...121.0) Control-lever position Degree: -1 ROTATIONAL-SPEED LIMITATION 17min: 600 Speed Cont.-rod travelmm: 15.60...16.40 1st version 1mm control-rod travel less than FULL-LOAD DELIV. AT FULL-LOAD STOP full-load trav.mm: 10.30 1st version 1/min: 1145...1160 Speed 1/min: 1100 Speed Del.quantity cm3/: 114.0...116.0 STARTING FUEL DELIVERY 1000H : (112.0...118.0) cm3/ 3.00 Dispersion Speed 1/min: 100 Del.quantity cm3/: 147.0...157.0 1000H.: (144.0...160.0) 1000%: (6.00) HIGHEST RATED SPEED Contr.-rod trav.mm: 15.70...16.30 Setting point: 1/min : 600 Speed LOW IDLE Contr.-rod trav.mm: 16.0 1/min : 250 Speed Contr.-rod trav.mm: 6.40...6.60

Del.quantity cm3/: 15.0...21.0

1000H:: (12.5...23.5)

Dispersion cm3/: 3.00 Testing: 1st c-rod trav.mm : 10.30 1/min : 1145...1160 Speed 2nd c-rod tray.mm : 4.00 1/min : 1195...1225 1000H.: (5.00) Speed 1/min : 1300 4th speed C-rod tray.mm : 0.00...1.00 Remarks: : MAN-NR. 2-7500 LOWEST RATED SPEED I Setting point w/out aux. spring Set idle stop at 250 min. -1 to a control-rod travel of 6.5 mm 1/min : 250 Speed

M20

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

: MAN 11.1 K1 Test sheet : 12.09.86 Edition

Superceeded

Calibrating oil : ISO-4113

Combination no. : 0 400 846 379

Injection pump

Pump designation : PES6A95D410LS2489

EP type number : 0 410 896 949

Governor

Governor design. : RQ250/1050AB894DL Governer no. : 0 420 202 256

Customer-spec. information Customer

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 003

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60

: (1.45...1.65)

Contr.-rod trav.mm: 9.00...12.00

: 1-5- 3- 6- 2-Cam sequence

SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) SD mark cyl. no. : 1 BASIC SETTING 1/mi: 1050 1st speed Contr.-rod trav.mm: 10.00...10.10 Del.quantity cm3/: 10.1...10.3 100H.: (9.9...10.5) Dispersion cm3/:0.3100H.: (0.6) 2nd speed 1/min: 250.0 Contr.-rod trav. m: 5.9...6.1 Del.quantity cm3/: 1.2...1.8 100H.: (0.9...2.0) Dispersion cm3/: 0.3 100H.: (0.5) SLEEVE POSITION Control-lever position Degree: -1 Speed 1/min: 600 Cont.-rod travelmm: 15.40...16.40 FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version 1/min: 1050 Speed Del.quantity cm3/: 101.5...103.5 1000H: (99.5...105.5) Dispersion cm3/: 3.50 1000H.: (6.00) HIGHEST RATED SPEED Setting point: Speed 1/min : 600 Contr.-rod trav.mm: 15.9 Testing: 1st c-rod trav.mm : 9.00 1/min : 1095...1110 Speed 2nd c-rod trav.mm : 4.00 1/min : 1140...1170 Speed LOWEST RATED SPEED I Setting point w/out aux. spring 1/min : 250 Speed Contr.-rod trav.mm: 6.0 Testing: Speed 1/min : 100

C-rod trav.mm min: 7.50 Speed 1/min : 250 : 5.90...6.10 : 2.00 C-rod trav.mm C-rod trav.mm 1/min: 360...400 Speed TORQUE CONTROL Dimension a mm : 0.35 Torque-control curve - 1st version 1st speed 1/min : 1050 C-rod trav.mm : 10.00...10.10 1/min : 500 2nd speed C-rod trav.mm : 10.50...10.60 4th speed 1/min : 960 C-rod trav.mm : 10.10...10.30 FUEL-DELIVERY CHARACTERISTICS 1/min : 500 Speed Del.quantity cm3/: 99.5...103.5 1000H.: (97.5...105.5) 1/min : 700 Speed Del.quantity cm3/: 99.5...103.5 1000H.: (97.5...105.5) ROTATIONAL-SPEED LIMITATION 1st version

1mm control-rod travel less than

full-load trav.mm: 9.00 Speed 1/min: 1095...1110

STARTING FUEL DELIVERY

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                          : 1.50...1.60
                                                      Prestroke mm
                                                                          : (1.45...1.65)
Note inst. in remarks column
                                                      Contr.-rod trav.mm: 9.00...12.00
                                                      Cam sequence : 1-5-3-6-2-4
Test sheet
                   : MAN 11 1P21
: 22.05.87
Superceeded : 12.9.86 Calibrating oil : ISO-4113
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (G.75)
Combination no.
                   : 0 400 846 502
                                                      SD mark cyl. no. : 6
Injection pump
Pump designation : PES6A95D410LS2542
                                                      BASIC SETTING
EP type number : 0 410 896 936
Governor
                                                      1st speed
                                                                   1/mi: 1100
Governor design. : R9250/1100AB1137-2L
Governer no. : 0 420 200 084
                                                      Contr.-rod trav.mm: 12.00...12.10
Customer-spec. information
                                                      Del.quantity cm3/: 12.4...12.6
Customer
                   : MAN
                                                                    100H.: (12.2...12.8)
Engine
                   : D2566 M/MF
                                                      Dispersion
                                                                    cm3/:0.3
1st version kW : 177.0
             1/min: 1500
                                                                    100H.: (0.6)
Speed
2nd version kW : 168.0
              1/min: 1500
Speed
                                                      2nd speed
                                                                    1/min: 250.0
                                                      Contr.-rod trav. m: 6.5...6.7
                                                     Del.quantity cm3/: 0.8...1.4
100H:: (0.5...1.6)
Dispersion cm3/: 0.3
100H:: (0.5)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. C
                    : 38...42
Overflow valve
                                                      SLEEVE POSITION
                    : 1 417 413 000
                                                      Control-lever position
                                                                   Degree: -1
Inlet press., bar : 1.00
                                                                    17min: 600
                                                      Speed
                                                      Cont.-rod travelmm: 15.60...16.40
Calibrating nozzle-holder
 assembly
                : 0 681 343 009
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
                                                      1st version
pressure, bar
                  : 172...175
                                                      Speed
                                                                    1/min: 1100
                                                     Del.quantity cm3/: 124.5...126.5
1000H.: (122.5...128.5)
Dispersion cm3/: 3.00
1000H.: (6.00)
Test inj. tubing
                   : 1 680 750 014
                                                      2nd version
Outside diameter
x Wall thickness
                                                      Speed
                                                                    1/min: 1100
                   : 6.00x2.00x600
                                                      Del.quantity cm3/: 118.0...120.0*
x Length mm
                                                                   1000H.: (116.0...122.0)
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                     HIGHEST RATED SPEED
    per values
                                                      Setting point:
                                                      Speed 1/min: 600
START OF DELIVERY
                                                     Contr.-rod trav.mm: 16.0
Test pressure, bar: 25...27
                                                     Testing:
                                                      1st c-rod trav.mm : 11.00
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1/min: 1145...1160 Speed 2nd c-rod trav.mm : 4.00 1/min: 1195...1225 Speed Setting point: 1/min : 600 \* Speed Contr.-rod trav.mm: 16.0 Testing: 1st c-rod trav.mm : 11.0 \* Speed 1/min: 1145...1160 2nd c-rod trav.mm: 4.00 1/min: 1195...1225 Speed LOWEST RATED SPEED I Setting point w/out aux. spring Speed 1/min : 250 Contr.-rod trav.mm: 6.0 Testing: Speed 1/min: 100 C-rod trav.mm min: 7.50 Speed 1/min : 250 : 5.90...6.10 C-rod trav.mm C-rod trav.mm : 2.00 1/min: 360...400 Speed TORQUE CONTROL Torque-control curve - 1st version t speed 1/min: 1100 C-rod trav.mm: 12.00...12.10 1st speed 2nd speed 1/min: 500 C-rod trav.mm : 12.00...12.20 Torque-control curve - 2nd version 1st speed 1/min : - \* C-rod trav.mm 2nd speed 1/min: -C-rod trav.mm : -FUEL-DELIVERY CHARACTERISTICS 1/min : 500 Speed Del.quantity cm3/: 107.5...113.5 1000H:: (105.5...115.5) Speed 1/min: 750 Del.quantity cm3/: 110.5...113.5 1000H.: (108.0...116.0) 1/min : 500 Speed Del.quantity cm3/ : 102.0...108.0 \* 1000H.: (100.0...110.0) 1/min : 750 Speed Del.quantity cm3/ : 106.0...109.0 \* 1000H.: (104.0...111.0) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than

Speed 1/min: 1145...1160

2nd version
1mm control-rod travel less than
full-load trav.mm: 11.00
Speed 1/min: 1145...1160 \*

STARTING FUEL DELIVERY

Remarks:

: MAN-NR. 2-7409

\* Version 2
\*Tropics version

full-load trav.mm: 11.00

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Note inst. in remarks column
Test sheet
                    : MAN 11,4 B4
                                                       SD mark cyl. no. : 6
                    : 12.09.86
Edition
Superceeded
                                                      BASIC SETTING
Calibrating oil : ISO-4113
                                                                      1/mi: 700
                                                       1st speed
Combination no. : 0 400 846 532
                                                      Contr.-rod trav.mm: 14.30...14.40
Injection pump
Pump designation : PES6A95D410LS2639-1
                                                      Del.quantity cm3/: 12.4...12.6
EP type number
                    : 0 410 896 920
                                                                     100H.: (12.2...12.8)
Governor
Governor design. : RQ250/1100AB1137-9L
Governer no.
                   : 0 420 200 091
                                                                     cm3/:0.3
                                                      Dispersion
                                                                     100H.: (0.6)
Customer-spec. information
                   : MAN
Customer
                                                      2nd speed 1/min: 250.0
Contr.-rod trav. m: 7.4...7.6
                    : D2566MF/220
Engine
                                                      Del.quantity cm3/: 1.0...1.6
TEST BENCH REQUIREMENTS
                                                                     100H.: (0.7...1.8) cm3/: 0.3
                                                      Dispersion
                                                                     100H.: (0.5)
Calibrating-oil inlet temp. °C
                    : 38...42
                                                      SLEEVE POSITION
Overflow valve
                                                      Control-lever position
                    : 1 417 413 000
                                                                   Degree: -1
1/min: 600
Inlet press., bar : 1.00
                                                      Cont.-rod travelmm: 15.60...16.40
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzle-holder
              : 0 681 343 009
 assembly
                                                      1st version
                                                      Speed
                                                                     1/min: 700
Opening
                                                      Del.quantity cm3/: 124.0...126.0
1000H.: (122.0...128.0)
Dispersion cm3/: 3.50
 pressure, bar : 172...175
                                                                    1000H.: (6.00)
Test in i. tubing : 1 680 750 014
Outside diameter
                                                      HIGHEST RATED SPEED
x Wall thickness
                    : 6.00x2.00x600
x Length mm
                                                      Setting point:
                                                                   1/min : 600
                                                      Contr.-rod trav.mm: 16.0
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                      Testing:
                                                      1st c-rod trav.mm : 11.80
    per values
                                                      Speed 1/min: 1145...1160
2nd c-rod trav.mm: 4.00
START OF DELIVERY
                                                                  1/min : 1240...1270
Test pressure, bar: 25...27
                                                        Speed
                                                      4th speed 1/min: 1350
                                                        C-rod trav.mm : 9.00...1.00
Prestroke mm
                    : 1.50...1.60
                    ; (1.45...1.55)
Contr.-rod tray.mm: 9.00...12.00
                                                      LOWEST RATED SPEED I
                                                      Setting point w/out aux. spring
Speed 1/min: 250
Contr.-rod trav.mm: 7.5
              : 1-5-3-6-2-4
Cam sequence
```

```
Testing:
             1/min : 100
Speed
C-rod trav.mm min : 8.90
            1/min : 250
mm : 7.40...7.60
Speed
C-rod trav.mm
                   : 2.00
C-rod trav.mm
            1/min : 390...430
Speed
TORQUE CONTROL
Dimension a mm : 0.65
Torque-control curve - 1st version
1st speed 1/min: 1100
C-rod trav.mm: 12.80...12.90
2nd speed 1/min: 600
  C-rod trav.mm : 14.30...14.40
3rd speed 1/min : 865
  C-rod trav.mm : 13.80...14.00
4th speed 1/min: 940
  C-rod trav.mm : 13.10...13.30
FUEL-DELIVERY CHARACTERISTICS
             1/min : 1100
Speed
Del.quantity cm3/: 119.0...123.0
1000H:: (116.5...125.5)
Speed 1/min: 500
Del.quantity cm3/: 124.0...127.0
1000H.: (121.5...129.5)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.80
             1/min : 1145...1160
Speed
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 105.0...115.0
1000H.: (102.0...118.0)
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 3- 4- 2 Note inst. in remarks column Test sheet : MB 4,0 E SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) : 12,09.86 Edition Superceeded : ISO-4113 Calibrating oil BASIC SETTING Combination no. : 0 400 874 242 1/mi: 700 1st speed Injection pump Contr.-rod trav.mm: 12.00...12.10 Pump designation : PES4A90D410RS2728 : 0 410 894 030 EP type number Del.quantity cm3/ : 5.7...5.9 Governor : RSV350...750A0C2006-Governor design. 100H.: (5.5...6.1) : 0 420 232 465 Governer no. cm3/:0.3Dispersion Customer-spec. information Customer : DAIMLER-BENZ 100H.: (0.4) : 0M364 1/min: 350.0 Engine 2nd speed Contr.-rod trav. m: 6.9...7.1 Del.quantity cm3/: 1.0...1.4 100H.: (0.8...1.6) 1st version kW : 36.0 Speed 1/min: 1500 cm3/: 0.2 100H.: (0.4) Dispersion TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C SLEEVE POSITION : 38...42 Control-lever position Degree: -3 1/min: 800 Overflow valve : 1 417 413 000 Cont.-rod travelmm: 0.30...0.10 Inlet press., bar : 1.00 Governor-spring reload Notch setting x : 2.00 Calibration nozzle-holder : 0 681 343 009 FULL-LOAD DELIV. AT FULL-LOAD STOP assemple: 1st version Opening pressure, bar : 172...175 1/min: 700 Speed Del.quantity cm3/: 57.0...59.0 1000H.: (55.0...61.0) Dispersion cm3/: 3.00 Test ini. tubing : 1 680 750 015 1000H.: (4,50) Outside diameter x Wall thickness HIGHEST RATED SPEED : 6.00X1.50X600 x Length mm 1st version Control-lever (A) Injection pump setting values position degrees: 26...34 Insp. values in parentheses Set constant delivery quant. Testing: per values 1st c-rod trav.mm : 11.00 Speed 1/min: 750...755 2nd c-rod trav.mm : 4.00 START OF DELIVERY 1/min : 780...793 1/min : 850.0 Test pressure, bar: 25...27 Speed 4th speed : 2.25...2.35 C-rod trav.mm : 0.30...1.40 Prestroke mm : (2.20...2.40)

M28

```
LOWEST RATED SPEED I
Control-lever
 position degrees: 12...20
Setting point w/out aux. spring Speed 1/min: 350 Contr.-rod trav.mm: 7.0
Testing:
Speed 1/min: 100
C-rod trav.mm min: 19.50
Speed 1/min: 350
C-rod trav.mm : 6.90...7.10
C-rod trav.mm : 2.00
Speed 1/min : 375...405
SET IDLE AUXILIARY SPRING
Speed 1/min : 2.00
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.00
Speed 1/min: 750...755
Speed
STARTING FUEL DELIVERY
Speed
                 1/min : 100
Del.quantity cm3/: 78.0...88.0
1000H.: (75.0...91.0)
Contr.~rod trav.mm: 16.50...16.90
Remarks:
Observe VDT-I-420/120
0
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                   1/mi: 1000
                                                     1st speed
Note inst. in remarks column
                                                    Contr.-rod trav.mm: 9.0
Test sheet
                   : CAS 8,3 J
                                                    Del.quantity cm3/ : 5,5...6,0
                   : 7.86
Edition
Superceeded
                                                                   100H.: (-)
                  : ISO-4113
Calibrating oil
                                                    2nd speed
                                                                   1/min: 200
                                                    Contr.-rod trav. m: 6,0
Del.quantity cm3/: 1,3...2,2
                   : 0 400 876 172
Combination no.
                                                                   100H.: (-)
Injection pump
Pump designation : PES6A80D420LS2054
                                                    SLEEVE POSITION
Governor
                    : RSV300...1000A2B461D
                                                    Control-lever position
Governor design.
                                                                 Degree: -3
1/min: 800
                                                    Speed
Customer-spec. information
                                                    Cont.-rod travelmm: 0,3...1,0
Customer
                   : CASE
                                                    Governor-spring reload
Engine
                   : A401D
                                                    Notch setting x : -
TEST BENCH REQUIREMENTS
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating-oil
                                                    1st version
                   : 38...42
                                                                  1/min: 980
                                                    Speed
                                                    Del.quantity cm3/: 64,0...65,0
                                                                 1000H.: (62,5...66,5)
Inlet press., bar : 1.5
Calibrating nozzle-holder
                                                    HIGHEST RATED SPEED
                  : 0 681 343 009
                                                    1st version
 assembly
                                                    Control-lever
                                                     position degrees: 42...50
Opening
 pressure, bar : 172...175
                                                    Testing:
                                                    1st c-rod trav.mm : 4,6
Test inj. tubing : 9 681 230 706
                                                                1/min : 1070
                                                      Speed
                                                    2nd c-rod trav.mm : 2,0
                                                    Speed 1/min: 1120
3rd c-rod trav.mm: 0.7
Outside diameter
x Wall thickness
                                                      Speed
x Length mm
                   : 6,00x2,00x600
                                                                 1/min : 1180
                                                    LOWEST RATED SPEED I
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                    Control-lever
                                                     position degrees: 19...27
                                                    Setting point w/out aux. spring
    per values ____
                                                    Speed 1/min: 300 Contr.-rod trav.mm: 5,5
START OF DELIVERY
Test pressure, bar: 2,15...2,25
                                                    Testing:
                              9.0
                                                                 1/min : 150
Prestroke mm
                                                    Speed
                        1-5-3-6-2-4
                                                    C-rod trav.mm min: 19,0
                                                    Speed 1/min: 300
                                                    C-rod trav.mm : 5,2...5,8
                                                    C-rod trav.mm
                                                                1/min : 400
8D ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0,5(0,75)
                                                    Speed
                                                                 1/min : 500
                                                    Speed
                                                    C-rod trav.mm max: 1.0
BASIC SETTING
                                                    TORQUE CONTROL
```

N02

```
Dimension a mm
                       : 980 0
                        : .0.01
                                         700 0
  C-rod trav.mm
2nd speed 1/min: .75..
C-rod trav.mm : .1.05
3rd speed 1/min : .75..
                                         400 0
  C-rod trav.mm : .1,05
FUEL-DELIVERY CHARACTERISTICS
ist version
Charge press. hPa: 700
Speed 1/min: 71<sub>2</sub>0
Speed 1/min: 71.0.
Del.quantity cm3/:..72.0
1000H:...73.5)
                                          (67,5
Charge press. hPa: 600
Speed 1/min: 70,0
Speed 1/min: 70.0.
Del.quantity cm3/:..72.0
1000H.:...75,0)
                                          (67,0)
```

#### STARTING FUEL DELIVERY

Speed 1/min: 100 Del.quantity cm3/: 76,0...84,0

#### HIGH IDLE

1st version Charge press. hPa : 1090 Speed 1/min : 13.5. Contr.-rod trav.mm: ..21,5

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Contr.-rod trav.mm: 9.00...12.00
                                                      Cam sequence : 1-5-3-6-2-4
Note inst. in remarks column
Test sheet
                    : MB 5.7 W 11
: 27.03.87
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Edition
Superceeded
Calibrating oil
                    : ISO-4113
                                                      BASIC SETTING
Combination no.
                    : 0 400 876 309
                                                                     1/mi: 1400
                                                      1st speed
Injection pump
Pump designation
                   : PES6A90D410RS2569
                                                      Contr.-rod trav.mm: 9.80...9.90
EP type number
                    : 0 410 896 071
Governor
                                                      Del.quantity cm3/: 5.4...5.5
                    : RSV350...1400A0C1135
Governor design.
                                                                     100H.: (5.2...5.7)
                      -1L
                    : 0 420 232 425
Governer no.
                                                      Dispersion
                                                                    cm3/: 0.3
Customer-spec. information
Gustomer
                                                                     100H.: (0.4)
                                                      2nd speed 1/min: 350.0
Contr.-rod trav. m: 7.9...8.1
Engine
                    : OM 352
                                                      Del.quantity cm3/: 0.9...1.5
100H.: (0.7...1.7)
1st version kW : 88.0
              1/min: 2400
Speed
                                                                    cm3/: 0.2
100H.: (0.4)
                                                      Dispersion
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                      SLEEVE POSITION
                    : 38...42
                                                      Control-lever position
                                                                   Degree: -3
Overflow valve
                                                                     17min: 800
                    : 1 417 413 000
                                                      Cont.-rod travelmm: 0.30...1.00
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Inlet press., bar : 1.00
Calibrating nozzle-holder
                                                      1st version
                                                      Speed 1/min: 1400
Del.quantity cm3/: 54.5...55.5
1000H.: (52.5...57.5)
Dispersion cm3/: 3.00
              : 0 681 343 009
 assembly
Opening
 pressure, bar : 172...175
                                                                    1000H.: (4.50)
Test inj. tubing : 1 680 750 014
                                                      HIGHEST RATED SPEED
                                                      1st version
Outside diameter
                                                      Control-lever
x Wall thickness
                                                       position degrees: 65...73
                    : 6.00x2.00x600
x Length mm
                                                      Testing:
(A) Injection pump setting values
                                                      1st c-rod trav.mm : 8.80
    Insp. values in parentheses
Set constant delivery quant.
                                                                  1/min : 1440...1450
                                                         Speed
                                                      2nd c-rod trav.mm : 4.00
    per values
                                                        Speed
                                                                  1/min : 1475...1505
                                                      3rd c-rod trav.mm : 4.00
                                                      Speed 1/min: 1505...1535
4th speed 1/min: 1600
START OF DELIVERY
Test pressure, bar: 25...27
                                                                          : 0.30...1.70
                                                        C-rod trav.mm
Prestroke mm : 2.25...2.35
                    : (2.20...2.40)
                                                      LOWEST RATED SPEED I
N04
```

Control-lever position degrees: 21...29 Setting point w/out aux. spring 1/min : 350 Speed Contr.-rod trav.mm: 7.5 Testing: 1/min : 100 Speed C-rod trav.mm min : 19.00 1/min: 350 .mm: 7.40...7.60 .mm: 2.00 Speed C-rod trav.mm C-rod trav.mm 1/min: 590...650 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1400 C-rod trav.mm : 9.80...9.90 d speed 1/min : 500 2nd speed C-rod trav.mm : 10.80...10.90 3rd speed 1/min: 950 C-rod trav.mm : 10.30...10.60 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 500 Del.quantity cm3/: 46.5...49.5 1000H.: (44.5...51.5) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 8.80 Speed 1/min : 1440...1450 STARTING FUEL DELIVERY Speed 1/min: 100 Del.quantity cm3/: 78.0...88.0 1000H.: (75.0...91.0) Contr.-rod trav.mm: 16.00...16.40

SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0.50(0.75) BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD mark cyl. no. : 1 Test sheet : DEE 6,6 B : 9.87 Edition BASIC SETTING : 7.86 Superceeded Calibrating oil : ISO-4113 1/mi: 1100 1st speed : 0 401 276 017 Contr.-rod trav.mm: 10.00 Combination no. Injection pump Del.quantity cm3/: 10.4...10.6 Pump designation : PES6A100D410RS3020 Governor 100H.: (10.2...10.8) Governor design. : RSV400...1100A2B660 cm3/:0.3Dispersion Customer-spec. information 100H.: (-) Customer : JOHN DEERE 1/min: 400 2nd speed Contr.-rod trav. m: 6.30
Del.quantity cm3/: 1.2...1.6
100H.: (1.0...1.8)
Dispersion cm3/: 0.3 : 6404 A Engine TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C 100H.: (-) : 38...42 SLEEVE POSITION Overflow valve Control-lever position Degree: -3 1/min: 800 : 1 417 413 000 Speed Inlet press., bar : 1.50 Cont.-rod travelmm: 0.30...1.40 FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating nozzle-holder : 0 681 343 009 assembly 1st version Opening Speed 1/min: 1100 Charge press. hPa: 500
Del.quantity cm3/: 104.0...106.0
1000H.: (102.0...108.0)
Dispersion cm3/: 3.0 pressure, bar : 172...175 Test inj. tubing : 1 680 750 014 1000H.: (-) Outside diameter HIGHEST RATED SPEED x Wall thickness : 6.00x2.00x600 1st version x Length mm Control-lever position degrees: 40...48 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Testing: per values 1st c-rod trav.mm : 9.00 Speed 1/min: 1145...1155 START OF DELIVERY 2nd c-rod trav.mm : 4.80 Speed 1/min : 1200 Prestroke mm : 2.00...2.10 4th speed 1/min: 1350 C-rod trav.mm : 0.30...1.70 : (1.95...2.15) Contr.-rod trav.mm: 10.00 Cam sequence : 1-5-3-6-2-4 LOWEST RATED SPEED I Control-lever position degrees: 17...25 Setting point w/out aux. spring

1/min : 400

Speed

```
Contr.-rod trav.mm: 5.80
Speed 1/min: 400
C-rod trav.mm : 6.20...6.40
C-rod trav.mm : 3.0
Speed 1/min : 480
              1/min : 600
Speed
C-rod trav.mm max: 1.00
TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min: 1100
C-rod trav.mm: 10.00
2nd speed 1/min: 750
C-rod trav.mm: 10.50
 compensator (LDA,ADA,ALDA)
1st version
Setting
              1/min : 550
hPa : 70
Speed
Pressure
Contr.-rod trav.mm: ?
Measurement
Speed
              1/min : 550
1st pressure hPa : 500
  G-rod tray.mm : 10.00
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 500
              1/min : 750
Speed
Del.quantity cm3/: 113.0...116.0
1000H.: (110.0...119.0)
Charge press. hPa:
              1/min : 550
Speed
Del.quantity cm3/: 62.0...68.0
              1000H.: (60.0...70.0)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 9.00
             1/min : 1145...1155
Speed
STARTING FUEL DELIVERY
              1/min : 100
Speed
Del.quantity cm3/: 155.0...175.0
              1000H.: (-)
HIGH IDLE
Speed
             1/min : 1200
```

N07

Del.quantity cm3/: 26.5...36.5 1000H.: (-)

LOW IDLE

Speed 1/min: 400 Del.quantity cm3/: 12.0...16.0 1000H.: (-)

Tractor (tractor engines)

Remarks: Start-of-delivery mark at 14° angular displacement of the cam after start of delivery of cylinder 1 with control-rod travel = 10.50 mm. APPLICATION

BOSCH INJ. PUMP TEST SPECIFICATIONS Contr.-rod trav.mm: 9.00...12.00 : 1- 8- 5- 10- 3- 7-Cam sequence Note inst. in remarks column 6- 11- 2- 9- 4- 12 Test sheet : SSC 14.0 A1 : 22.05.87 Edition SD ang. spacing CS: 0-15-60-75-120-135-: 10.85 Superceeded Calibrating oil : ISO-4113 180-195-240-255-300-315 Tolerance + - 0 : 0.50 (0.75) : 0 401 830 711 Combination no. Injection pump BASIC SETTING Pump designation : PE12P100A520/6RS3103 1/mi: 1000 1st speed : 0 411 800 703 EP type number Contr.-rod trav.mm: 11.60...11.70 Governor Governor design. : RQV375...1000PA639-2 Governer no. : 0 421 813 514 Del.quantity cm3/: 9.3...9.5 Customer-spec. information 100H.: (9.1...9.7) Customer : SSCM Dispersion cm3/:0.3Engine : V 12.520 AN 100H.: (0.6) 1st version kW : 220.0 2nd speed 1/min: 375.0 Contr.-rod trav. m: 7.6...7.8 1/min: 2000 Speed Del.quantity cm3/: 1.0...1.4 100H.: (0.7...1.6) TEST BENCH REQUIREMENTS cm3/: 0.3 100H.: (0.5) Calibrating-oil inlet temp. °C Dispersion : 38...42 (B) Setting of injection pump with Overflow valve externally-mounted governor : 1 417 413 025 SLEEVE TRAVELS Inlet press., bar : 1.50 1st speed 1/min: 350 Sleeve travel mm: 1.10...1.60 Calibrating nozzle-holder : 0 681 343 009 2nd speed 1/min: 450 assembly Sleeve travel mm: 3.30...3.70
3rd speed 1/min: 700
Sleeve travel mm: 5.20...5.60
4th speed 1/min: 1000 Opening pressure, bar : 172...175 Sleeve travel mm: 7.60...7.80 Test inj. tubing : 1 680 750 015 SLEEVE POSITION Control-lever position Outside diameter x Wall thickness Degree: -1 17min: 1075 : 6.00x1.50x600 x Length mm Speed Cont.-rod travelmm: 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. FULL-LOAD DELIV. AT FULL-LOAD STOP per values 1st version 1/min: 1000 Speed Del.quantity cm3/: 93.5...95.5 1000H:: (91.5...97.5) Dispersion cm3/: 3.50 1000H:: (6.00) START OF DELIVERY Test pressure, bar: 25...27 : 2.80...2.90 Prestroke mm : (2.75...2.95)

NO8

HIGHEST RATED SPEED 1st version Control-lever position degrees: 116...124 Testing: 1st c-rod trav.mm : 10.60 Speed 1/min: 1040...1950 2nd c-rod trav.mm: 4.00 Speed 1/min: 1125...1155 4th speed 1/min: 1250 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 71...79 Testing: 1/min : 100 Speed C-rod trav.mm min : 9.20 Speed 1/min : 375 C-rod trav.mm : 7.60...7.80 CONSTANT REGULATION 1/min : 375...475 Speed SWITCH-OVER POINT 1/min : 320 (340) Speed ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 10.60 Speed 1/min : 1040...1050 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 230.0...250.0 1000H.: (226.0...254.0) Remarks:

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Note inst. in remarks column
Test sheet
                    : MB 11,8 E 1
: 21.05.87
                                                      SD mark cyl. no. : 1
Edition
Superceeded
                                                      BASIC SETTING
Calibrating oil
                   : ISO-4113
                                                      1st speed
                                                                      1/mi: 1100
Combination no.
                    : 0 401 846 329
                                                      Contr.-rod trav.mm: 13.00...13.10
Injection pump
Pump designation : PE6P100A720RS15
                                                      Del.quantity cm3/: 11.8...12.0
EP type number
                    : 0 411 806 106
                                                                     100H.: (11.6...12.2)
Governor
Governor design. : RQ250/1100PA269R
                                                                     cm3/:0.3
Governer no.
                    : 0 421 801 050
                                                      Dispersion
Customer-spec. information
                                                                     100H.: (0.6)
Customer
                    : DAIMLER-BENZ
                                                      2nd speed 1/min: 250.0
Contr.-rod trav. m: 7.4...7.6
Del.quantity cm3/: 1.7...2.3
100H.: (1.4...2.5)
Dispersion cm3/: 0.3
Engine
                    : OM 355
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. C
                                                                     100H.: (0.5)
                    : 38...42
                                                      SLEEVE POSITION
Overflow valve
                                                      Control-lever position
                    : 1 417 413 025
                                                                    Degree: -1
                                                                     17min: 600
                                                      Speed
                                                      Cont.-rod travelmm: 15.60...16.40
Inlet press., bar : 1.50
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzle-holder
                   : 0 681 343 009
 assembly
                                                      1st version
                                                                     1/min: 1100
                                                      Speed
Opening
                                                      Del.quantity cm3/: 118.5...120.5
 pressure, bar : 172...175
                                                                   1000H.: (116.5...122.5)
cm3/ : 3.00
1000H.: (6.00)
                                                      Dispersion
Test inj. tubing
                   : 1 680 750 015
                                                      HIGHEST RATED SPEED
Outside diameter
x Wall thickness
                   : 6.00x1.50x600
x Length mm
                                                      Setting point:
                                                      Speed -
                                                                   1/min : 600
                                                      Contr.-rod trav.mm: 16.0
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                      Testing:
                                                      1st c-rod trav.mm : 12.00
    per values ____
                                                                 1/min : 1125...1145
                                                         Speed
                                                      2nd c-rod trav.mm: 4.00
START OF DELIVERY
Test pressure, bar: 25...27
                                                        Speed 1/min: 1195...1230
                                                      4th speed 1/min: 1300
                    : (2.80...2.90
: (2.75...2.95)
                                                        C-rod trav.mm : 0.00...1.50
Prestroke mm
                                                      LOWEST RATED SPEED I
Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1-5-3-6-2-4
                                                      Setting point w/out aux. spring
                                                                   1/min : 250
                                                      Contr.-rod trav.mm: 6.0
```

```
Testing:
```

Speed 1/min: 100 C-rod trav.mm min: 7.00

1/min : 250 Speed

C-rod trav.mm : 5.90...6.10 C-rod trav.mm : 2.00 Speed 1/min : 385...425

## FUEL-DELIVERY CHARACTERISTICS

Speed 1/min: 450 Del.quantity cm3/: 101.0...105.0 1000H:: (99.0...107.0)

#### ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 12.00

Speed 1/min: 1125...1145

### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 140.0...160.0 1000H.: (136.0...164.0)

```
: 1-5- 3- 6- 2- 4
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                         Cam sequence
Note inst. in remarks column
Test sheet
                                                         SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
                     : ENA 11.9 A
                     : 28.08.87
Edition
Superceeded
Calibrating oil : ISO-4113
                                                         SD mark cyl. no. : 1
                     : 0 401 846 550
                                                         BASIC SETTING
Combination no.
Injection pump
                                                                       1/mi: 1030
                                                         1st speed
Pump designation : PE6P120A320RS257
EP type number
                     : 0 411 826 075
                                                         Contr.-rod trav.mm: 12.30...12.40
Governor
                     : RQV250...1050PA808-2
Governor design.
                                                         Del.quantity cm3/:?
Governer no.
                     : 0 421 813 666
                                                                        100H.: (7)
Customer-spec. information
                                                                        1/min: 250.0
Customer
                     : ENASA
                                                         2nd speed
                                                         Contr.-rod trav. m: ?
Del.quantity cm3/: 1.7...2.3
100H.: (1.4...2.6)
Dispersion cm3/: 0.8
100H.: (1.2)
                     : 96 T1 CX
Engine
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                     : 38...42
                                                         (B) Setting of injection pump with
                                                              externally-mounted governor
Overflow valve
                     : 1 417 413 025
                                                         SLEEVE TRAVELS
                                                         1st speed 1/min: 250
                                                         Sleeve travel mm: 1.00...1.40
2nd speed 1/min: 350
Inlet press., bar : 1.50
                                                           Sleeve travel mm: 1.70...2.30
Calibrating nozzle-holder
                                                         3rd speed 1/min: 700
 assembly
                 : 1 688 901 019
                                                         Sleeve travel mm: 4.50...5.10
4th speed 1/min: 1095
Sleeve travel mm: 8.20...8.40
5th speed 1/min: 1185
Opening
                     : 207...210
 pressure, bar
                                                           Sleeve travel mm: 9.20...9.60
Perforated-plate
                     : 0,8
 diameter mm
                                                         SLEEVE POSITION
                                                         Control-lever position
                                                         Degree: -1
Speed 1/min: 1115
Cont.-rod travelmm: 15.20...17.80
                    : 1 680 750 067
Test inj. tubing
Outside diameter
x Wall thickness
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
                    : 6.00x1.50x1000
x Length mm
                                                         1st version
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                                        1/min: 1030
                                                         Speed
                                                         Charge press. hPa : 900
                                                         Del.quantity cm3/: ?
1000H.: (?)
    per values
START OF DELIVERY
Test pressure, bar: 25...27
                                                         HIGHEST RATED SPEED
                                                         1st version
                     : 2.80...2.90
Prestroke mm
                                                         Control-lever
                     : (2.75...2.95)
                                                          position degrees: 43...51
Contr.-rod trav.mm: 9.00...12.00
N12
```

Testing: 1st c-rod trav.mm : 11.30 Speed 1/min : 1090...1100 2nd c-rod trav.mm : 4.00 1/min: 1170...1200 Speed 1/min : 1300 4th speed C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: ? Testing: 1/min : 100 Speed C-rod trav.mm min : 1.50 1/min : 250 Speed C-rod trav.mm CONSTANT REGULATION 1/min : 250...370 Speed compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 Speed hPa : 900 Pressure Contr.-rod trav.mm: 12,30...12.40 Measurement 1/min : 500 Speed 1st pressure hPa : -: 8.20...9.60 C-rod trav.mm 2nd pressure hPa : 570 C-rod trav.mm : 11.60...11.70 3rd pressure hPa : 280 : 9.90...10.10 C-rod trav.mm FUEL-DELIVERY CHARACTERISTICS 1st version Charge press, hPa : 900 1/min : 650 Speed Del.quantity cm3/: ? 1000H.: (?) Charge press. hPa : -1/min : 500 Speed Del.quantity cm3/ : ? 1000H.: (?) ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 11.30 1/min: 1090...1100 Speed

N13

STARTING FUEL DELIVERY

1/min : 100 Speed

LOW IDLE

Speed 1/min: 250
Del.quantity cm3/: 17.0...23.0
1000H.: (14.0...26.0)
Dispersion cm3/: 8.00 1000H.: (12.00)

Remarks:

Test specifications upon request.

**APPLICATION** Special-purpose vehicle

BOSCH INJ. PUMP TEST SPECIFICATIONS SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Note inst. in remarks column Test sheet Edition : VOL 10.0 Q8 : 18.09.87 SD mark cyl. no. : 1 Edition Superceeded : 23.9.86 BASIC SETTING Calibrating oil : ISO-4113 1/mi: 700 1st speed : 0 401 846 757 Combination no. Contr.-rod trav.mm: 9.00...9.10 Injection pump Pump designation : PE6P110A320RS3108 Del.quantity cm3/: 9.2...9.4 EP type number : 0 411 816 727 100H.: (8.9...9.7) Governor Governor design. : RQV250...1100PA649 Governer no. : 0 421 813 346 Dispersion cm3/:0.4100H.: (0.7) Customer-spec. information Customer : VOLVO 2nd speed 1/min: 250 Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/: 2.9...3.3

100H.: (2.6...3.5)

Dispersion cm3/: 0.3

100H.: (0.6) : THD 100EA Engine TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. C : 38...42 (B) Setting of injection pump with externally-mounted governor Overflow valve : 1 417 413 025 SLEEVE TRAVELS Inlet press., bar: 1.50 1st speed 1/min: 250 Steeve travel mm: 1.10...1.30
2nd speed 1/min: 500
Steeve travel mm: 4.10...4.90
3rd speed 1/min: 700 Calibrating nozzle-holder : 0 681 343 009 assembly Sleeve travel mm: 6.30...6.70 Opening pressure, bar : 172...175 4th speed 1/min: 950 Sleeve travel mm: 6.30...6.70 5th speed 1/min: 1100 Sleeve travel mm: 7.00...7.50 Test in i. tubing : 1 680 750 015 Outside diameter SLEEVE POSITION x Wall thickness Control-lever position : 6.00x1.50x600 x Length mm Degree: -1 17min: 1175 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Cont.-rod travelmm: 15.20...17.80 FULL-LOAD DELIV. AT FULL-LOAD STOP per values 1st version Speed 1/min: 700
Del.quantity cm3/: 92.0...94.0
1000H.: (89.0...97.0)
Dispersion cm3/: 4.00 START OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 3.00...3.10 : (2.95...3.15) 1000H.: (7.50) Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2- 4 HIGHEST RATED SPEED 1st version

```
Control-lever
 position degrees: 61...69
Testing:
1st c-rod trav.mm : 8.00
  Speed 1/min: 1160...1170
2nd c-rod trav.mm: 4.00
             1/min: 1220...1250
  Speed
4th speed 1/min: 1350
  C-rod trav.mm : 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 7...15
Testing:
             1/min : 100
Speed
C-rod trav.mm min: 6.80
           1/min : 250
Speed
                  : 5.30...5.50
: 2.00
C-rod trav.mm
C-rod trav.mm
            1/min: 350...410
Speed
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 8.00
Speed
             1/min : 1160...1170
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 160.0...190.0
1000H.: (-)
Contr.-rod trav.mm: 20.00...21.00
LOW IDLE
             1/min : 250
Speed
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/: 29.0...33.0
1000H.: (26.5...35.5)
Dispersion cm3/: 3.00
             1000H.: (6,00)
Remarks:
On activation of the starting solenoid,
the start position must be reached.
Delivery-valve spring pre-tension = 2.40...2.60 mm.
Permissible alteration from 2.20...2.90
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                        : 4.00...4.10
: (3.95...4.15)
                                                     Prestroke mm
Note inst. in remarks column
                                                     Contr.-rod trav.mm: 9.00...12.00
                                                     Cam sequence : 6- 3- 5- 2-
                                                                                           4- 1
Test sheet
                   : MB 11,0 R
Edition
                   : 31.07.87
: 3.85
Superceeded
                                                     SD ang. spacing ^{\circ} CS: 0-45-120-165-240-285 Tolerance + - ^{\circ} : 0.50 (0.75)
Calibrating oil
                  : ISO-4113
                   : 0 401 846 805
Combination no.
                                                     SD mark cyl. no. : 6
Injection pump
Pump designation : PE6P110A320LS3814-10
                                                     BASIC SETTING
EP type number : 0 411 816 741
Governor
                                                                  1/mi: 1150
                                                     1st speed
Governor design. : RQ300/1150PA187-6
                                                     Contr.-rod trav.mm: 12.40...12.50
Governer no.
                   : 0 421 801 155
Customer-spec, information
                                                     Del.quantity cm3/: 13.2...13.4
Customer
                   : DAIMLER-BENZ
                                                                   100H.: (12.9...13.6)
                   : 0M421
Engine
                                                     Dispersion
                                                                   cm3/:0.4
1st version kW : 159.0
             1/min: 2300
Speed
                                                                   100H.: (0.8)
TEST BENCH REQUIREMENTS
                                                                   1/min: 300.0
                                                     2nd speed
                                                     Contr.-rod trav. m: 8.3...8.5
                                                    Del.quantity cm3/: 1.2...1.8
100H.: (0.9...2.0)
Dispersion cm3/: 0.4
100H.: (0.7)
Calibrating-oil inlet temp. C
                   : 38...42
Overflow valve
                   : 1 417 413 025
                                                     SLEEVE POSITION
Inlet press., bar : 1.50
                                                     Control-lever position
                                                                  Degree: -1
                                                                  17min: 650
Overflow
                                                     Speed
 quantity min. 1/h: 100...120
                                                     Cont.-rod travelmm: 13.20...14.00
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzle-holder
 assembly : 0 681 343 009
                                                     1st version
Jpening
                                                                   1/min: 1150
                                                     Speed
 pressure, bar : 172...175
                                                     Del.quantity cm3/: 132.0...134.0
                                                                 1000H: (129.5...136.5)
cm3/: 4.00
1000H: (8.00)
                                                     Dispersion
Test inj. tubing : 1 680 750 015
Outside diameter
                                                     HIGHEST RATED SPEED
x Wall thickness
                   : 6.00x1.50x600
x Length mm
                                                     Setting point:
                                                     Speed 1/min : 650
(A) Injection pump setting values
                                                     Contr.-rod trav.mm: 13.6
    Insp. values in parentheses
Set constant delivery quant.
                                                     Testing:
                                                     1st c-rod trav.mm : 11.50
    per values
                                                       Speed 1/min: 1195...1210
                                                     2nd c-rod trav.mm : 4.00
START OF DELIVERY
                                                                1/min : 1240...1270
                                                       Speed
Test pressure, bar: 25...27
                                                     4th speed 1/min: 1350
```

```
: 0.00...1.50
  C-rod trav.mm
LOWEST RATED SPEED I
Setting point W/out aux. spring
Speed 1/min: 300
Contr.-rod trav.mm: 8.4
Testing:
Speed
             1/min : 100
C-rod trav.mm min : 10.00
             1/min : 300
Speed
                 : 8.30...8.50
: 2.00
C-rod trav.mm
C-rod trav.mm
Speed
            1/min : 430...470
FUEL-DELIVERY CHARACTERISTICS
             1/min : 600
Speed
Del.quantity cm3/: 110.0...114.0
             1000H.: (107.0...117.0)
cm3/: 6.00
1000H.: (9.00)
Dispersion
SETTING CONTROL-ROD STOP
             1/min : 600
Speed
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.50
            1/min : 1195...1210
Speed
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 130.0...150.0
             1000H.: (126.0...154.0)
Remarks:
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                          : 4.00...4.10
                                                      Prestroke mm
                                                                           : (3.95...4.15)
                                                      Contr.-rod trav.mm: 9.00...12.00
Note inst. in remarks column
                                                      Cam sequence : 6- 3- 5- 2- 4- 1
Test sheet
                   : MB 11,0 S
                    : 12.09.86
Edition
Superceeded
                                                      SD ang. spacing CS: 0-45-120-165-240-285 Tolerance + - : 0.50 (0.75)
Calibrating oil : ISO-4113
                    : 0 401 846 823
Combination no.
                                                      SD mark cyl. no. : 6
Injection pump
Pump designation : PE6P110A320L$3835
EP type number : 0 411 816 749
                                                      BASIC SETTING
                                                                    1/mi: 900
Governor
                                                      1st speed
Governor design. : RQ300/900PA187-14
                                                      Contr.-rod trav.mm: 12.50...12.60
Governer no. : 0 421 801 357
Customer-spec. information
                                                      Del.quantity cm3/: 12.6...12.8
Customer
                   : DAIMLER-BENZ
                                                                     100H.: (12.3...13.0)
Engine
                    : 0M441
                                                      Dispersion
                                                                     cm3/:0.4
1st version kW : 150.0
             1/min: 1800
                                                                     100H.: (0.8)
Speed
TEST BENCH REQUIREMENTS
                                                                     1/min: 300.0
                                                      2nd speed
                                                      Contr.-rod tray. m: 8.0...8.2
                                                      Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.4)
Dispersion cm3/: 0.4
100H.: (0.7)
Calibrating-oil inlet temp. °C
                   : 38...42
Overflow valve
                    : 1 417 413 025
                                                      SLEEVE POSITION
                                                      Control-lever position
Inlet press., bar: 1.50
                                                                    Degree: -1
                                                                    17min: 650
Overflow
                                                      Cont.-rod travelmm: 13.20...14.00
 quantity min. 1/h: 100...120
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzle-holder
             : 0 681 343 009
 assembly
                                                      1st version
                                                                     1/min: 900
Opening
                                                      Speed
                                                      Del.quantity cm3/: 126.0...128.0
pressure, bar : 172...175
                                                                   1000H.: (123.5...130.5)
cm3/: 4.00
1000H.: (8.00)
                                                      Dispersion
Test inj. tubing : 1 680 750 015
Outside diameter
                                                      HIGHEST RATED SPEED
x Wall thickness
                    : 6,00X1,50X600
                                                      Setting point:
x Length mm
                                                                  1/min : 650
(A) Injection pump setting values
                                                      Contr.-rod trav.mm: 13.6
    Insp. values in parentheses
Set constant delivery quant.
                                                      Testing:
                                                      1st c-rod trav.mm : 11.50
Speed 1/min : 940...955
    per values
                                                      2nd c-rod trav.mm : 4.00
START OF DELIVERY
                                                      Speed 1/min: 985...1015
4th speed 1/min: 1100
Test pressure, bar: 25...27
N18
```

: 0.00...1.00 C-rod trav.mm LOWEST RATED SPEED I Setting point w/out aux. spring Speed 1/min: 300 Contr.-rod trav.mm: 8.1 Testing: Speed 1/min : 100 C-rod trav.mm min : 9.30 1/min : 300 Speed C-rod trav.mm : 8.00 C-rod trav.mm : 2.00 1/min: 430...470 Speed FUEL-DELIVERY CHARACTERISTICS 1/min : 600 Speed Del.quantity cm3/: 124.0...128.0 1000H.: (121.0...131.0) cm3/:6.00Dispersion 1000H.: (9,00) SETTING CONTROL-ROD STOP Speed 1/min : 600 ROTATIONAL-SPEED LIMITATION 1st version 1mm control-rod travel less than full-load trav.mm: 11.50 1/min: 940...955 Speed STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 130.0...150.0 1000H.: (126.0...154.0) Remarks:

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                         Prestroke mm
                                                                              : 4.00...4.10
                                                                              : (3.95...4.15)
Note inst. in remarks column
                                                         Contr.-rod trav.mm: 9.00...12.00
                                                         Cam sequence : 6- 3- 5- 2- 4- 1
Test sheet
Edition
Superceeded
                    : MB 11.0 S 1
: 4.9.87
Superceeded : 12.9.86 Calibrating oil : ISO-4113
                                                         SD ang. spacing CS: 0-45-120-165-240-285
Tolerance + - : 0.50 (0.75)
                    : 0 401 846 824
Combination no.
                                                         SD mark cyl. no. : 6
Injection pump
Pump designation : PE6P110A320LS3835
                                                         BASIC SETTING
                    : 0 411 816 749
EP type number
                                                                         1/mi: 900
Covernor
                                                         1st speed
Governor design. : RQV300...1150PA524-1
Governer no. : 0 421 813 549
                                                         Contr.-rod trav.mm: 12.90...13.00
Customer-spec. information
                                                         Del.quantity cm3/: 12.6...12.8
Customer
                     : DAIMLER-BENZ
                                                                        100H.: (12.3...13.0)
                     : OM 441
Engine
                                                                        cm3/:0.4
                                                         Dispersion
1st version kW : 150.0
               1/min: 1800
                                                                        100H.: (0.8)
Speed
TEST BENCH REQUIREMENTS
                                                                        1/min: 300.0
                                                         2nd speed
                                                         Contr.-rod trav. m: 8.0...8.2
                                                         Del.quantity cm3/: 1.6...2.2
100H.: (1.3...2.4)
Calibrating-oil inlet temp. °C
                    : 38...42
                                                                        cm3/: 0.4
100H.: (0.7)
                                                         Dispersion
Overflow valve
                     : 1 417 413 025
                                                         (B) Setting of injection pump with externally-mounted governor
Inlet press., bar : 1.50
Overflow
                                                         SLEEVE TRAVELS
 quantity min. 1/h: 100...120
                                                         1st speed 1/min: 320
                                                         Sleeve travel mm: 1.50...1.70
2nd speed 1/min: 400
Sleeve travel mm: 2.30...2.70
Calibrating nozzle-holder
 assembly : 0 681 343 009
                                                         3rd speed 1/min: 945
                                                           Sleeve travel mm: 8.30...8.70
Opening
                                                         4th speed 1/min: 1000
 pressure, bar : 172...175
                                                           Sleeve travel mm: 9.40...10.00
                                                         SLEEVE POSITION
Test inj. tubing : 1 680 750 015
                                                         Control-lever position
                                                                       Degree: -1
1/min: 920
Outside diameter
x Wall thickness
                     : 6.00x1.50x600
                                                         Cont.-rod travelmm: 15.20...17.80
x Length mm
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                         1st version
    per values
                                                                        1/min: 900
                                                         Speed
                                                         Del.quantity cm3/: 126.0...128.0
1000H.: (123.5...130.5)
Dispersion cm3/: 4.00
START OF DELIVERY
Test pressure, bar: 25...27
                                                                       1000H.: (8.00)
N20
```

```
HIGHEST RATED SPEED
1st version
Control-lever
 position degrees: 50...58
Testing:
1st c-rod trav.mm : 11.90
  Speed 1/min: 955...965
2nd c-rod trav.mm : 4.00
Speed 1/min: 1010...1040
4th speed 1/min: 1100
C-rod trav.mm: 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 16...24
Testing:
              1/min : 100
Speed
C-rod trav.mm min : 9.50
Speed 1/min: 300
                : 8.00...8.20
C-rod trav.mm
CONSTANT REGULATION
        1/min : 300...500
Speed
SWITCH-OVER POINT
Speed
              1/min : 220 (240)
FUEL-DELIVERY CHARACTERISTICS
              1/min : 600
Speed
Del.quantity cm3/: 124.0...128.0
1000H.: (121.0...131.0)
Dispersion cm3/: 6.00
1000H.: (8.00)
ROTATIONAL-SPEED LIMITATION
1st version
1mm control-rod travel less than
 full-load trav.mm: 11.90
Speed 1/min: 955...965
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 130.0...150.0
1000H.: (126.0...154.0)
Remarks:
```

```
: 4.00...4.10
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                    Prestroke mm
                                                                       : (3.95...4.15)
                                                    Contr.-rod trav.mm: 9.00...12.00
Note inst. in remarks column
                                                    Cam sequence : 6- 3- 5- 2- 4- 1
Test sheet
Edition
Superceeded
                 : MB 11,0 S 4
                  : 18.09.87
Superceeded : 12.9.86 Galibrating oil : ISO-4113
                                                    SD ang. spacing CS: 0-45-120-165-240-285 Tolerance + - 0.50 (0.75)
Combination no.
                  : 0 401 846 830
                                                    SD mark cyl. no. : 6
Injection pump
Pump designation : PE6P110A320LS3835
                                                    BASIC SETTING
EP type number
                : 0 411 816 749
                                                    1st speed 1/mi: 950
Governor
Governor design. : RQV300...950PA829K
Governer no. : 0 421 815 166
                                                    Contr.-rod trav.mm: 13.10...13.20
Customer-spec. information
                                                    Del.quantity cm3/: 12.6...12.8
Customer
                  : DAIMLER-BENZ
                                                                 100H.: (12.3...13.0)
Engine
                  : 0M441
                                                                 cm3/:0.4
                                                    Dispersion
1st version kW : 150.0
            1/min: 1900
                                                                 100H.: (0.8)
Speed
TEST BENCH REQUIREMENTS
                                                    2nd speed
                                                                 1/min: 300
                                                   Calibrating-oil inlet temp. °C : 38...42
Overflow valve
                   : 1 417 413 025
                                                    (B) Setting of injection pump with
Inlet press., bar : 1.50
                                                        externally-mounted governor
Overflow
                                                    SLEEVE TRAVELS
                                                   1st speed 1/min: 300
Sleeve travel mm: 1.10...1.30
 quantity min. 1/h: 100...120
                                                   2nd speed 1/min: 500
Sleeve travel mm: 3.20...3.40
Calibrating nozzle-holder
 assembly : 0 681 343 009
                                                                1/min: 800
                                                    3rd speed
                                                      Sleeve travel mm: 5.90...6.10
Opening
                                                    4th speed 1/min: 1000
pressure, bar : 172...175
                                                      Sieeve travel mm: 8.00...8.40
                                                    5th speed 1/min: 1050
Test inj. tubing : 1 680 750 015
                                                     Sleeve travel mm: 9.50...10.00
                                                    SLEEVE POSITION
Outside diameter
x Wall thickness
                                                   Control-lever position
                                                                Degree: -1
1/min: 975
                 : 6.00x1.50x600
x Length mm
                                                   Cont.-rod travelmm: 15.20...17.80
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                   FULL-LOAD DELIV. AT FULL-LOAD STOP
    per values
                                                   1st version
START OF DELIVERY
                                                                 1/min: 950
                                                   Speed
Test pressure, bar: 25...27
                                                   Del.quantity cm3/: 126.0...128.0
                                                                1000H.: (123.5...130.5)
```

Dispersion cm3/ : 4.00 1000H.: (8.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 57...65 Setting point: 1/min : 975 Speed Contr.-rod trav.mm: 16.5 Testing: 1st c-rod trav.mm : 12.10 1/min: 990...1000 Speed 2nd c-rod trav.mm : 4.00 1/min: 1045...1075 Speed 1/min : 1300 4th speed C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Setting point w/out aux. spring Speed 1/min : 300 Contr.-rod trav.mm: 8.9 Testing: 1/min : 100 Speed C-rod trav.mm min: 10.60 1/min : 300 Speed : 8.80...9.00 C-rod trav.mm CONSTANT REGULATION 1/min : 300...450 Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 975 1st speed : 13.10...13.20 C-rod trav.mm 2nd speed 1/min: 600 C-rod trav.mm : 12.90...13.10 3rd speed 1/min: 750 : 13.10...13.30 C-rod trav.mm SWITCH-OVER POINT Speed 1/min : 220 (240) FUEL-DELIVERY CHARACTERISTICS 1/min : 600 Speed Del.quantity cm3/: 117.0...120.0 1000H.: (114.0...123.0) Dispersion cm3/: 6.00 1000H.: (9.00) Speed 1/min: 750 Del.quantity cm3/: 120.0...124.0 1000H.: (117.0...127.0) cm3/:6.00Dispersion

1000H.: (9.00)

ROTATIONAL-SPEED LIMITATION

1st version 1mm control-rod travel less than

full-load trav.mm: 12.10 Speed 1/min: 990...1000

STARTING FUEL DELIVERY

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11.7 Edition : 18.09.87 Superceeded : 15.5.87 Calibrating oil : ISO-4113 : DAF 11.7 D1 : 18.09.87

Combination no. : 0 401 846 831

Injection pump

Pump designation : PE6P12OA32ORS3183-1Y

EP type number : 0 411 826 765

Governor

Governor design. : RQ250/1000PA832 Governor no. : 0 421 801 368

Customer-spec. information Customer

: WS 282 Engine

1st version kW : 282.0 Speed 1/min: 2000

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Perforated-plate

diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80 : (3.65...3.85) Contr.-rod trav.mm: 9.00...12.00 LOWEST RATED SPEED I Setting point w/out aux. spring Cam sequence : 1-5-3-6-2-4 Speed 1/min : 250 Contr.-rod trav.mm: 7.0 Testing: SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) 1/min : 100 Speed C-rod trav.mm min: 8.50 1/min : 250 Speed C-rod trav.mm : 6.90...7.19 C-rod trav.mm : 2.00 Speed 1/min : 350...390 BASIC SETTING 1st speed 1/mi: 850 Contr.-rod trav.mm: 13.10...13.20 TORQUE CONTROL Torque-control curve - 1st version Del.quantity cm3/: 21.9...22.1 1st speed 1/min: 850 C-rod trav.mm : 13.30...13.40 2nd speed 1/min : 1000 100H.: (21.6...22.4) C-rod trav.min : 13.20...13.40 cm3/:0.5Dispersion compensator (LDA, ADA, ALDA) 100H.: (0.9) 1/min: 250.0 2nd speed 1st version Contr.-rod trav. m: 6.9...7.1 Del.quantity cm3/: 1.4...2.0 100H.: (1.1...2.3) Dispersion cm3/: 0.8 100H.: (1.2) Setting 1/min : 600 Speed Pressure hPa : 1000 Contr.-rod trav.mm: 13.10...13.20 Measurement SLEEVE POSITION Speed 1/min : 600 Control-lever position Degree: -1 1st pressure hPa : -17min: 550 C-rod trav.mm : 10.10...10.30 2nd pressure hPa : 570 Cont.-rod travelmm: 15.60...16.40 C-rod trav.mm : 12.40...12.50 3rd pressure hPa : 310 FULL-LOAD DELIV. AT FULL-LOAD STOP C-rod trav.mm : 10,70,...11.00 1st version FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 850 Charge press. hPa: 1000
Del.quantity cm3/: 219.0...221.0
1000H.: (216.0...224.0)
Dispersion cm3/: 5.00 Charge press. hPa : -Speed 1/min: 600 Del.guantity cm3/: 144.0...146.0 1000H.: (141.0...149.0) 1000H.: (9.00) ROTATIONAL-SPEED LIMITATION HIGHEST RATED SPEED 1st version 1mm control-rod travel less than Setting point: Speed 1/min : 550 Contr.-rod trav.mm: 16.0 full-load trav.mm: 12.10 1/min : 1035...1050 Speed Testing: 1st c-rod trav.mm : 12.10 STARTING FUEL DELIVERY Speed 1/min: 1035...1050 2nd c-rod trav.mm: 4.00 Speed 1/min: 1120...1150 4th speed 1/min : 1250 C-rod trav.mm : 0.00...1.00 N25

# LOW IDLE